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ABSTRACT

A resource/curriculum guide developed for teachers of grades 4-6 is intended to help Iowa students learn about agriculture in Iowa: its importance as the state's major industry, its role as a source of employment and careers, and its role in meeting basic human needs for nutrition, clothing, and shelter. The guide recommends that, wherever possible, students should be given the opportunity to learn directly from people connected with agriculture, such as classroom speakers, on field trips to farms or vocational agriculture laboratories, and by visits to agriculture fairs and shopping center exhibits. Five basic elements to aid teachers are included in the seven units: a 45-item pre/post test for diagnostic and evaluation purposes; background information for each unit; suggested activities and masters for reproduction; resource lists of materials, people, and possible field trips; and a key system to distinguish between student activities, student information sheets, transparency masters, student "just for fun" sheets, and teacher information pages. The units are "The American Farmer: The First 200 Years," "The Challenge of Farming," "Life on an Iowa Farm," "What Agriculture Does for You," "Iowa--The Land and its Products," "Eating for a Happy, Healthy Body," and "A Glimpse into the Future." (MH)

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AGRICULTURE IN IOWA

A curriculum guide developed for use by 4th, 5th, and 6th grade teachers.

1982

AGRICULTURE IN IOWA

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The American Farmer: The First 200 Years

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> *"Agriculture is the cornerstone of Iowa's economy. Cash receipts from marketing of farm products by Iowa farmers total over $8 billion in annual farm income. Eight out of every ten Iowa workers depend directly or indirectly upon agriculture for their jobs. The ramifications, though, of a powerful Iowa agriculture go well beyond the borders of our state. This is true because over 90 percent of our total agricultural production is market outside the state, and about 30 percent of the total moves through the international export trade channel. That is why the eyes of the nation and the world frequently focus upon Iowa--for Iowa is truly in the center of the breadbasket of the world."*
>
> *Robert H. Lounsberry*
> *Iowa Secretary of Agriculture*

This resource guide has been developed to help the students of Iowa learn about agriculture in Iowa--its importance as the state's major industry, its role as a source of employment and careers, and the role of agriculture in meeting basic human nutritional, clothing and shelter needs required for everyday living.

This guide complements the existing elementary social studies and science programs for grades 4-6. During that grade span, most school systems teach about Iowa's history, geography and other aspects of the social studies. In an effort to increase knowledge and awareness of agriculture in the state, objectives, activities and materials have been designed to extend and reinforce students' basic social studies and science skills.

Included with this unit are materials which may be used by students and teachers in the classroom. Wherever possible, students should be given the opportunity to learn directly from people connected with agriculture. State leaders of the Farm Bureau, Cooperative Extension Service, and commodity groups have pledged their assistance in identifying local representatives who will work with local school personnel in teaching the unit in the most interesting and effective manner. Learning activities may be accomplished in various ways, including classroom speakers, field trips to farms or vocational agriculture laboratories, and visits to agriculture fairs or shopping center exhibits.

We hope that you will find this guide to be both interesting and a valuable classroom tool.

ACKNOWLEDGEMENTS

The *Agriculture in Iowa* Resource Guide is the result of a cooperative effort of Iowa State University, the Iowa Department of Agriculture, and the following Agricultural Groups.

Iowa Beef Industry Council
Iowa Corn Promotion Board
Dairy Council Inc. of Iowa
Iowa Development Commission
Iowa Egg Council
Iowa Farm Bureau
Iowa Farm Bureau Women
Iowa Pork Producers
Iowa Soybean Promotion Board
Iowa Turkey Federation

The following groups contributed through Iowa Youthpower.

AGRI Industries
Dairy Council, Inc.
Iowa Beef Industry Council
Iowa Development Commission
The Iowa Dietetic Association
Iowa Egg Council
Iowa Farm Bureau Federation
Iowa Farm Bureau Federation Women
Iowa Food Industries Assoc.
Iowa Grain and Feed Association
The Iowa, Hospital, Institution, and Ed. Food Service Society
Iowa Medical Society
Iowa Pork Producers Association
Iowa Poultry Association
Iowa Retail Food Dealers Association
Iowa Sheep Producers Association
Iowa Soybean Promotion Board
Interstate Producers Livestock
Marketing Div., Iowa Dept. of Agriculture
Midland United Dairy Ind. Assoc.
Safeway Stores, Inc.

This publication is the result of the expenditure of time and application of talents by several people.

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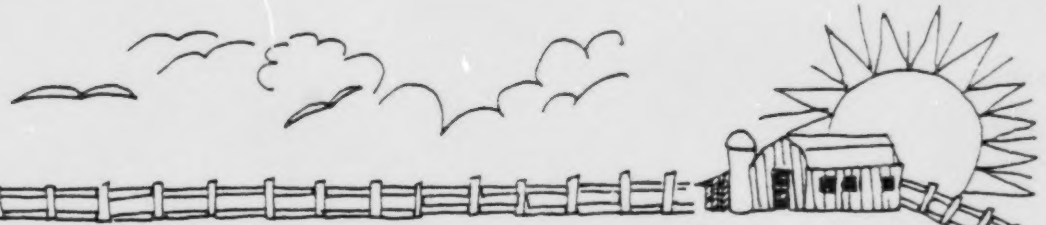

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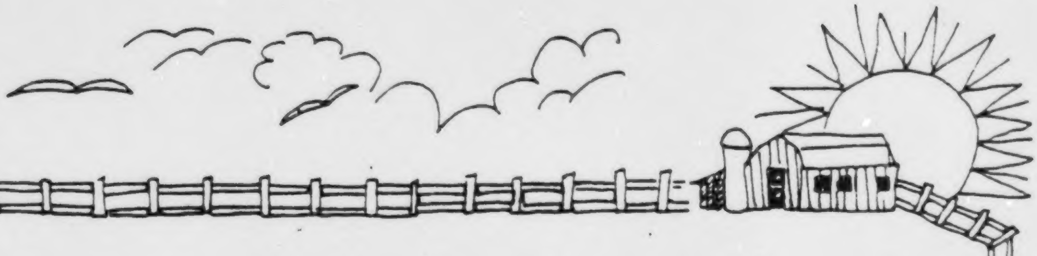

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INTRODUCTION

Two centuries ago, Americans produced part of their own food. Most families had a garden, a flock of chickens, a cow or a pig or two--even those in the larger towns. Today, most of us are totally dependent on distant farms for the food we eat.

Farms have changed too. Most of them are commercial businesses. Today, farmers have a huge investment in their land and must rely on costly machinery instead of labor to get the job done. Each year they must risk money and labor and hope it will pay off. The labor involved is not only in agricultural production but also includes the labor of the steelworker who produces the parts for a tractor.

"Agriculture in Iowa" is a social studies/science career awareness resource guide for use in upper level elementary classrooms.

There are four major goals of the guide:

1. Realize the role of agriculture/agribusiness in the economy of Iowa.
2. Familiarize students with crops and livestock commonly grown in Iowa.
3. Develop an awareness of the many different occupations and careers within the field of agriculture.
4. Create an awareness of and an appreciation for, the significance of agriculture, food and food production.

The resource guide contains background information for teachers, masters for activity sheets and transparencies, suggested activities, a pre/post test, and a glossary.

How to Use the Resource Guide

The elements in this resource unit can be a valuable resource for familiarizing students with the role of agriculture in Iowa's economy. It could also prove to be a valuable resource for infusion of career awareness into the elementary curriculum. Eight out of every ten Iowa workers depend upon agriculture for their jobs. The agriculture industry encompasses many jobs, not only related to food or fiber production, but also supplying services, information and supplies to farmers, as well as processing and transporting food and fiber to the consumer.

This guide was primarily designed as a resource guide. Teachers should feel free to select those activities which are appropriate to students and their existing curriculum.

Elements of the Guide

The guide contains five basic elements to aid the teacher:

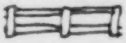
1. Pre/post test
   --A 45-item test to be used for diagnostic and evaluation purposes.

2. Teacher information
   --The teacher is given background information for each unit.

3. Suggested activities and masters for reproduction
   --Activities are designed as teaching tools, not evaluation instruments. They suggest ways of presenting content to students. Many of the activities can be presented orally or through transfer to the chalkboard. These activities include stories, masters for worksheets and masters for transparencies. Games can be reproduced on heavy paper or pasted to cardboard or laminated for re-use next year.

4. Resource listing of materials, people and field trip suggestions
   --This listing of materials should be extremely helpful to a teacher with little background in agriculture. Additional publications and information can be obtained from your county extension agents or various commodity groups. Local Farm Bureaus will give students first hand experience in what it is like to farm by providing speakers or locating farms to visit. The many high school or community college vocational agriculture departments throughout the state will also be willing to act as contacts between teachers and the many community people who are eager to work with schools.

5. The system used to identify pages and activities is designed to make the guide easy to use


-the fence border around the edge of the page means the page is teacher information.

ACT -identifies a student activity.
INFO -identifies a student information sheet.
TM -identifies a transparency master.
FUN -identifies a student "just for fun" sheet.

PRETEST-a

HOW MUCH DO YOU KNOW ABOUT AGRICULTURE IN IOWA?

How much do you know about farms and agriculture in Iowa? Do you know how many people in our country depend on the business of agriculture? How many of the things we use every day come from the American farm?

Let's see how much you know. Read each of the statements carefully. Circle "T" for true or "F" for false.

T F 1. One acre of land is about the size of a football field.

T F 2. It takes a new born calf about five years to become full grown.

T F 3. When an average apple tree is fully grown, it will produce apples for about 280 pies every year.

T F 4. A single chicken will lay about 365 eggs a year.

T F 5. One dairy cow may produce 62 glasses of milk daily.

T F 6. To reach a market weight of 220 pounds, a pig must eat just 220 pounds of feed.

T F 7. Agriculture is the number one industry in Iowa.

T F 8. Iowa is a major beef producer and ranks fourth among the states in beef production.

T F 9. We eat beef only in the form of hamburgers.

T F 10. One average beef animal that weighs 1,000 pounds will provide 432 pounds of beef.

T F 11. One out of four pork chops eaten in the United States comes from an Iowa hog.

T F 12. Iowa ranks number one in the production of hogs in the United States.

T F 13. Iowa ranks high among other states with a large number of producers having their own flocks of sheep.

T F 14. Protein builds strong bodies and muscles, repairs body tissues and helps to fight infections.

T F 15. One average size one-quarter pound hamburger will give you one-third of the iron you need each day.

T F 16. One-half of Iowa's land is being used for growing crops.

x

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T F 17. Farm products marketed by Iowa farmers total more than $8 billion each year.

T F 18. Eight out of every ten Iowa workers depend directly or indirectly upon agriculture for their jobs.

T F 19. About 30% of Iowa's agricultural products are exported to other countries.

T F 20. Iowa is in the center of the breadbasket of the world.

T F 21. Laboratories within the Iowa Department of Agriculture insure quality and safety of food products.

T F 22. Iowa is the number one state in total farm population.

T F 23. Corn starch is made from corn.

T F 24. Iowa ranks number one in corn production.

T F 25. Iowa ranks second in cheese production.

T F 26. Shortening, cooking oil, and margarines contain a high percentage of soy oil.

T F 27. Iowa ranks tenth in the nation in turkey production.

T F 28. Two eggs provide almost 1/3 of the protein needed in a daily diet.

T F 29. Eggs are pre-packaged with no preservatives.

T F 30. Each year a sheep produces enough wool to make five sweaters.

T F 31. Farrowing is the process of giving birth to a calf.

T F 32. A calf can grow from birth to about 500 pounds on cow's milk and pasture.

T F 33. Most of Iowa's corn is fed to livestock.

T F 34. Iowa ranks third in the production of popcorn.

T F 35. Soybeans are used only for livestock feed.

T F 36. Cows eat grass, hay and silage--which humans can't eat--and convert it into milk.

T F 37. Elementary school children should drink milk or eat a dairy product only once a day.

T F 38. When you become a teenager, milk or milk products will be needed four times a day.

T F 39. Both imports and exports can affect agricultural production.

T F 40. Horticultural crops were an available source of food for the Iowa settlers.

T F 41. Veterinarians and livestock inspectors within the Iowa Department of Agriculture protect the health of the livestock industry of Iowa.

T F 42. Periodic testing and vaccinating prevents many losses to the livestock producer and keeps our animals healthy.

T F 43. Herbicides and pesticides have made the farmer's job much easier.

T F 44. Regular granulated table sugar is sweeter than corn fructose.

T F 45. Soybeans were orginally grown in the 1930's for a hay crop.

PRETEST KEY-a

HOW MUCH DO YOU KNOW ABOUT AGRICULTURE IN IOWA?

How much do you know about farms and agriculture in Iowa? Do you know how many people in our country depend on the business of agriculture? How many of the things we use every day come from the American farm?

Let's see how much you know. Read each of the statements carefully. Circle "T" for true or "F" for false.

[✓ T] F 1. One acre of land is about the size of a football field.

T [✓ F] 2. It takes a new born calf about ~~five years~~ (18-24 months) to become full grown.

[✓ T] F 3. When an average apple tree is fully grown, it will produce apples for about 280 pies every year.

T [✓ F] 4. A single chicken will lay about ~~365~~ (240) eggs a year.

[✓ T] F 5. One dairy cow may produce 62 glasses of milk daily.

T [✓ F] 6. To reach a market weight of 220 pounds, a pig must eat just ~~220~~ (680) pounds of feed.

[✓ T] F 7. Agriculture is the number one industry in Iowa.

[✓ T] F 8. Iowa is a major beef producer and ranks fourth among the states in beef production.

T [✓ F] 9. We eat beef only in the form of hamburgers.

[✓ T] F 10. One average beef animal that weighs 1,000 pounds will provide 432 pounds of beef.

[✓ T] F 11. One out of four pork chops eaten in the United States comes from an Iowa hog.

[✓ T] F 12. Iowa ranks number one in the production of hogs in the United States.

[✓ T] F 13. Iowa ranks high among other states with a large number of producers having their own flocks of sheep.

[✓ T] F 14. Protein builds strong bodies and muscles, repairs body tissues and helps to fight infections.

[✓ T] F 15. One average size one-quarter pound hamburger will give you one-third of the iron you need each day.

T [✓ F] 16. (three-fourths) One-half of Iowa's land is being used for growing crops.

[✓ T] F 17. Farm products marketed by Iowa farmers total more than $8 billion each year.

[✓ T] F 18. Eight out of every ten Iowa workers depend directly or indirectly upon agriculture for their jobs.

[✓ T] F 19. About 30% of Iowa's agricultural products are exported to other countries.

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T [✓ F] 30. Each year a sheep produces enough wool to make ~~five~~ (two) sweaters.

T [✓ F] 31. Farrowing is the process of giving birth to a ~~calf~~. (pig)

[✓ T] F 32. A calf can grow from birth to about 500 pounds on cow's milk and pasture.

[✓ T] F 33. Most of Iowa's corn is fed to livestock.

[✓ T] F 34. Iowa ranks third in the production of popcorn.

T [✓ F] 35. Soybeans are used only for livestock feed.

[✓ T] F 36. Cows eat grass, hay and silage--which humans can't eat--and convert it into milk.

T [✓ F] 37. Elementary school children should drink milk or eat a dairy product only once a day. (3 times)

[✓ T] F 38. When you become a teenager, milk or milk products will be needed four times a day.

[✓ T] F 39. Both imports and exports can affect agricultural production.

[✓ T] F 40. Horticultural crops were an available source of food for the Iowa settlers.

[✓ T] F 41. Veterinarians and livestock inspectors within the Iowa Department of Agriculture protect the health of the livestock industry of Iowa.

[✓ T] F 42. Periodic testing and vaccinating prevents many losses to the livestock producer and keeps our animals healthy.

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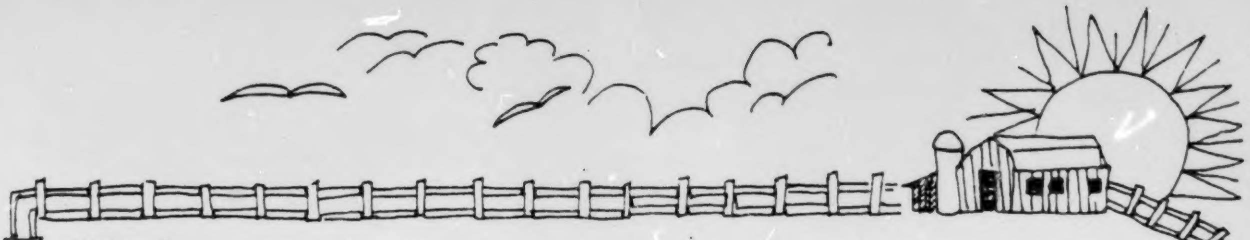


Unit 1
Chapter 1

FROM MUSCLE TO MACHINERY

The American Farmer

The American farmer, armed with the crude tools of European agriculture, battled the land with muscle, sweat and courage during the early years. Their strong hands were calloused from the grueling, day-to-day labor. Farming was an occupation for the young and the strong with a will to endure hardships. In the early 1800's, farmers fought the land with such tools as the horse-drawn cultivator, harrow, plow and an assortment of hand tools.

The first machines were simple labor-saving devices that were drawn by horses, mules, and oxen. As the need for change became evident, man set about meeting those needs. When sticky prairie soils stuck to plows, they quickly designed new ones. Gradually, machines became more efficient and more complicated until the farmer could sit atop a self-propelled machine.

Invention of the cotton gin by Eli Whitney, in 1793 made slavery profitable in the southern U.S., encouraged westward movement of planters, and made cotton the primary agricultural export of the new nation. The cotton gin made it possible to separate seeds from the lint of cotton both quickly and at a low cost.

In response to the need for a plow that would efficiently turn the sticky prairie soils, John Lane and John Deere separately used steel for the moldboards and shares of plows. Soil, which had a tendency to cling to wooden or iron plows, could now be turned with the steel plows.

Harvesting of grain with scythes and sickles was replaced by the McCormick reaper. The reaper, invented by Cyrus H. McCormick, in 1831, was a horse-drawn grain harvester. McCormick's great success is credited to a decision in which he decided to move his factory from Virginia to Chicago, the future grain marketing center of the United States.

Other important machines, powered by horses, were invented. Among these were the grain drill, cultivator, mower, and threshing machine. All of these inventions marked the beginning of the first great agricultural revolution in the United States. Adoption of these new technologies was rather slow until the onset of the Civil War. Labor shortages, strong demands and higher prices for farm products speeded the adoption of new technology.

Settlement of new land, granted by the Homestead Act, and the first American agricultural revolution led to a steady increase in total production. Between 1870 and 1900, total production doubled. As farm production increased farm prices declined. Surpluses continued until the onset of World War I. Farm prices increased sharply during the war and then declined as sharply during the 1920's.

In the early 1930's, nature joined forces with the economic depression and turned part of Mid-America into a dust bowl. A series of droughts forced thousands of farmers and their families to leave Oklahoma, Texas, and other plains states to find jobs on the West coast.

Most of the groundwork for the second agricultural revolution had been laid prior to World War II. New methods, crops, breeds of livestock and labor-saving machinery were available to farmers in the 1920"s and 1930's.

World War II led directly to the second American agricultural revolution. Higher prices, high levels of price support, an unlimited demand for farm products, shortage of farm labor and government appeals to increase production brought about a virtual completion of the change-over from animal to mechanical power.

After World War II, the continued demand for food for foreign relief and price supports encouraged farmers to increase their use of mechanical power and machinery, fertilizer, feed and seed, and other production items. It also made conditions favorable to adopt new technology. Adoption of technology in the second agricultural revolution resulted in sharp gains in production, despite 50 million fewer acres of cropland and 9 billion fewer hours of labor being used.

Since World War II and the adoption of new technology, farmers have increased the size of their farms, and experienced a general upward trend in income and a rising standard of living. Today's American farmer little resembles his colonial ancestor of 200 years ago. Resources, institutions and technology have made American agriculture the world's most productive. In contrast to earlier times when inventions or practices were adopted one-at-a time, today's farmers use a "system to increase agricultural productivity.

Each agricultural revolution meant that the farmer could produce more feed to feed more people. For instance, in the. . .

1700's . . . One farm worker could feed three people.
1800's . . . One farm worker could feed five people.
1982 . . . . One farm worker could feed 78 people.
2000 . . . . One farm worker will feed 80 people.

SUGGESTED ACTIVITIES

1. Using TM-1, discuss the definition of agriculture and agricultural revolution.
2. Using ACT-1, elicit oral responses to "Quick Quiz" questions. Ask students if they can give examples of agricultural revolutions.
3. After discussing meaning of agricultural revolution, divide class into three groups, ask each group to give oral reports on one of the agricultural revolutions. See if they can name other technological advances which have increased production.
4. To demonstrate efficiency of machines, ask students how they mow their lawn? Clippers? Push mower? Gasoline push mower? Riding mower? Discuss labor and time involved in each process.
5. Write or call the nearest farm machinery company (Ford, Sperry-New Holland, Allis Chalmers, John Deere, International Harvester, Massey Ferguson). Ask them to send you catalogs or brochures of farm machines. Use them for a bulletin board display.
6. Ask students to bring in pictures from magazines and construct a collage of farm machinery or other technological advances.
7. Using "Milestones in American Agriculture", ask students to pinpoint where each agricultural revolution occurred.
8. Using reference materials available in your school library, ask students to find development dates for each of the

following:

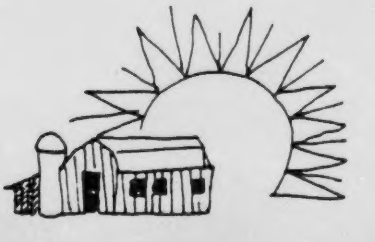
electricity
grain combine
cultivator
fence
grain drill
threshing machine
mower
reaper

Once again using "Milestones in American Agriculture," insert in proper sequence.

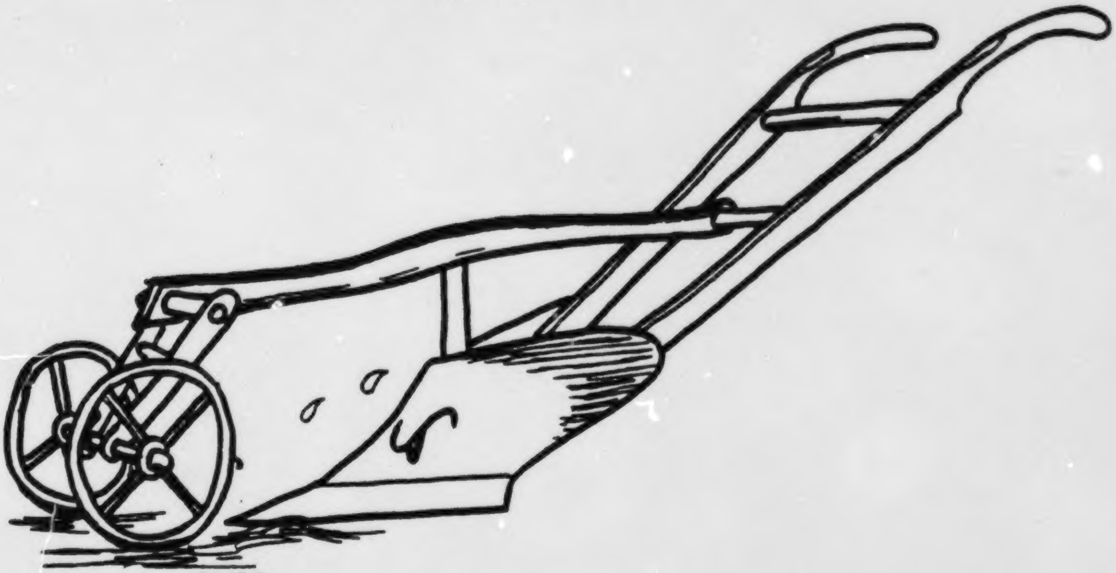
9. Have the students create a graph to show the number of people fed by one farmer in 1700, 1300, 1982 and 2000.

10. Discuss equipment, chemicals and other technical advances which might help the farmer in their daily life.

11. Call the nearest vocational agriculture teacher. This teacher will sponsor the local chapter of the Future Farmers of America. The FFA has available an excellent educational program for elementary school students called "Food for America." Invite them to your school to make their presentation.



AGRICULTURE:

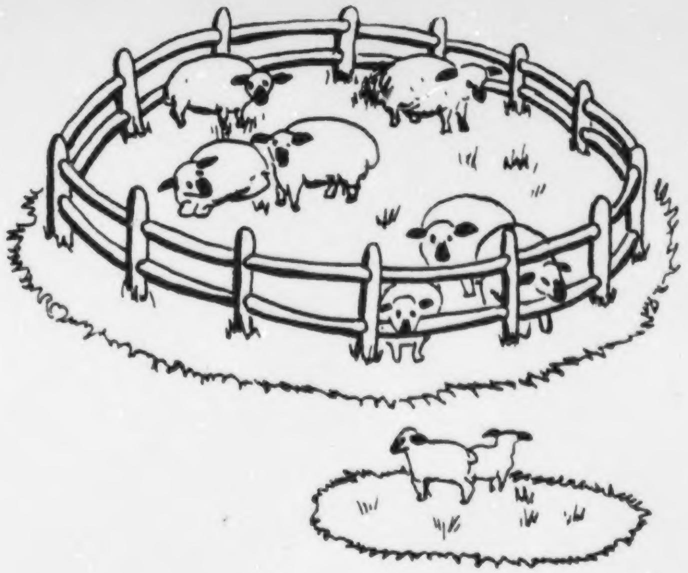


1. The science or art of cultivating the soil, producing crops, and raising livestock and in different degrees, the preparation of these products for use by human beings: 2.Farming.

Unit 1
TM-1a

AGRICULTURAL REVOLUTION

a major change in how farmers raise crops and livestock



AGRICULTURE AND THE AGRICULTURAL REVOLUTION

During the last few hundred years, there have been at least three agricultural revolutions, one in England and two in America. Each one came about as the result of new inventions and discoveries for farming. But they all had one thing in common: Farmers could produce more and more food.

The English Agricultural Revolution

A fence may seem like a simple enough idea. But the key to England's agricultural revolution was the fence. And this knowledge was brought to America.

For years, farmers had known that if you fenced in the livestock, you wouldn't lose them. But then during the early 1700's it dawned on some very clever farmers that you didn't have to keep all the cattle in one pen. You could pick out the strongest, or biggest, or even best-looking cow and bull you had, and put them together. They would mate. And their calves would be just like the parents. This is called controlled breeding. It was the fence that helped farmers learn how to control breeding and produce better and better livestock.

At about the same time, a new idea in crop rotation was being tried. Here again, fences played an important part.

Farmers, of course, knew that planting wheat in the same field every year was not good. It reduced yields and caused plant diseases. They also knew about the three-field system of crop rotation, which left a field unplanted one year out of every three years. It did, however, increase their yields.

But during the 1700's, a man--who later earned the nickname "Turnip" Townsend--discovered the four-field system of crop rotation. He thought turnips gave the soil many of the nutrients other crops took away. So he planted clover in one field the first year; two different kinds of wheat in that same field the next two years; and turnips in the field the fourth year.

Actually, "Turnip" Townsend was wrong about turnips. It really was the clover, which adds nitrogen to the soil, and the changing of crops from one year to the next that gave him bigger harvests.

This meant that all of a farmer's land could be planted every year. No field had to be left fallow--or unplanted--as in the three-field system of crop rotation.

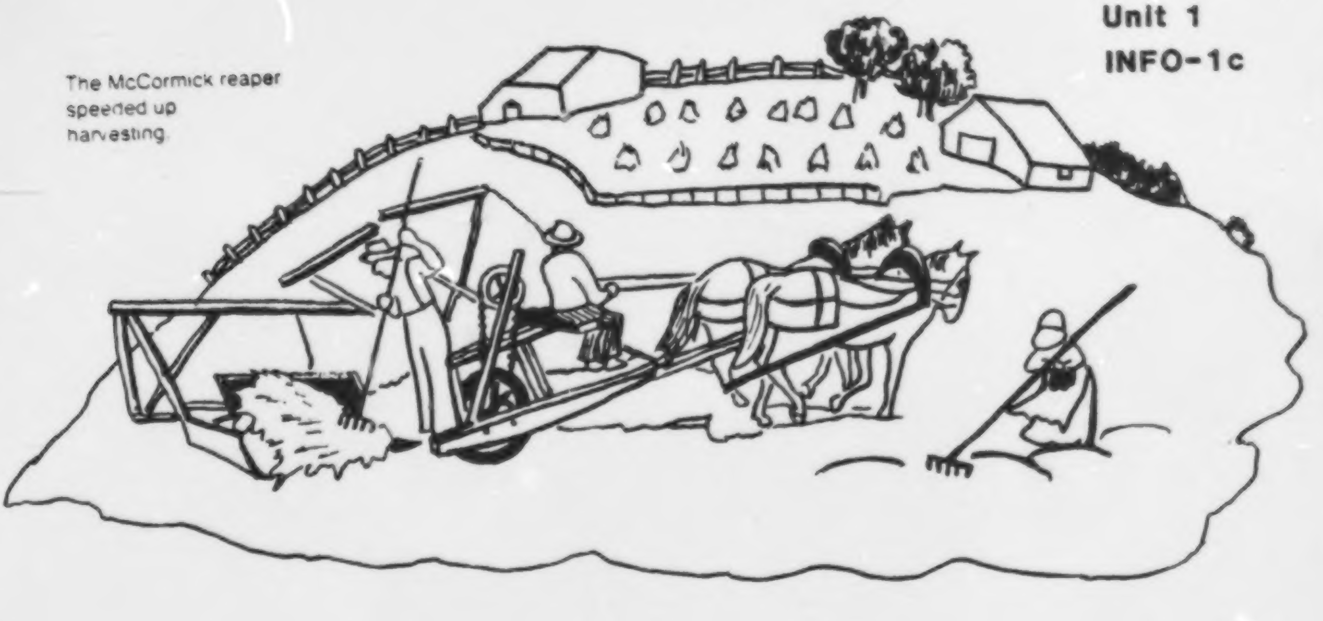
Fences helped the farmer divide his land, and keep stray animals out of the fields.

Today, Iowa farmers still follow crop rotations. They plant soybeans to provide the nitrogen instead of clover. Two years of corn, one year of oats and one year of soybeans is a common rotation. Two years of corn and one year of soybeans is also used. Another common rotation is corn followed by soybeans on an every other year basis.

Four field crop rotation

Clover
1st year
Two kinds of wheat 2nd and 3rd year
Turnips
4th year

"What's to Eat", The United States Department of Agriculture Yearbook, 1979.



The McCormick reaper speeded up harvesting.

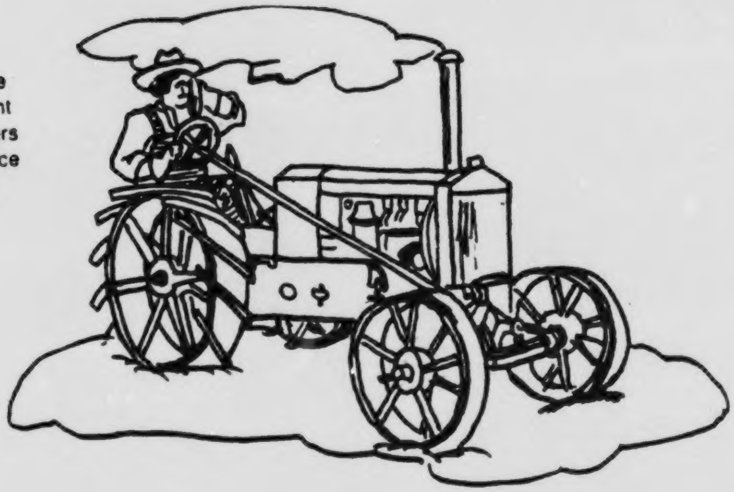
The First American Revolution

Our Civil War, 1861-65, helped cause a revolution in farming. Since a lot of men who worked on farms went to war, the farmers who were left turned to machines for help. With higher grain prices, they could now afford to pay for machines and tools invented 20 or 30 years earlier.

Among the new machines were the McCormick reaper which speeded up harvesting, the steel plow, a practical grain drill for planting seeds and a horse powered threshing machine. (A threshing machine separates the seed from the harvested plant.)

These and other inventions brought about the first American agricultural revolution. The revolution meant that fewer workers were needed to produce food crops, and each farm worker could produce more food to feed more people.

"What to Eat", The United States Department of Agriculture Yearbook, 1979.



The gasoline tractor meant fewer workers could produce more food.

The Second American Revolution

Up until World War II, most farmers continued to use horses to plow and harvest the fields. But during the war, the United States needed more grain. We had to feed our country, and help feed our allies overseas.

Gasoline tractors had been invented long before the war. But farmers didn't think they needed these expensive, noisy machines. In order to produce more food, however, farmers needed help. So they turned from horsepower to "tractorpower." It still took until the early 1950's, though, for there to be more tractors on American farms than work horses and mules. By then, the second American agricultural revolution was well underway.

Today the agricultural revolution continues. Better machines and advances in science have made it possible to grow more food more efficiently. In the last 20 years, for instance, farm machines have improved greatly. The modern combine is a machine that can cut, thresh and clean a crop all at the same time. This saves the farmer a lot of work. The modern grain drill is another improved machine. It does more than just drop seed on the ground. It can plant a crop, put fertilizer in the ground, and provide for weed control--all in one pass over the field.

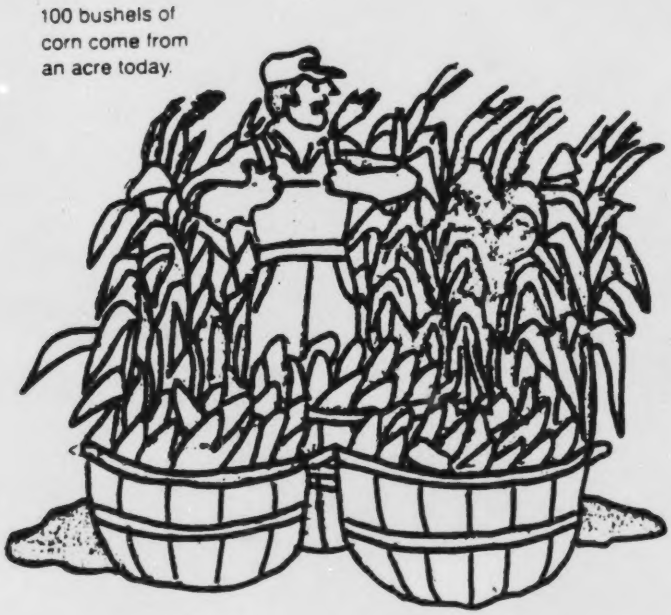
Hybrid seeds are available today. They produce a much higher yield. For example, if you had planted an acre of corn 100 years ago you could expect toget only about 28 bushels of corn. Today in Iowa, you would get about 127 bushels from that same acre.

Livestock is more productive now due to controlled breeding. The average dairy cow produces nearly three times as much milk as in 1945. And chickens today grow faster than they did when your parents were young.

Crops and livestock now are better protected from disease and pests. Animals get shots and vitamins and special feed developed just for them. Plants are protected from insects and weeds both with and without chemicals.

These important improvements, as well as many other advancements, have worked together to bring about today's agricultural revolution. They have made it possible for farmers to produce more food on their farms than even scientists had imagined possible just a few decades ago.

And progress continues!


100 bushels of corn come from an acre today.

"What's to Eat", The United States Department of Agriculture Yearbook, 1979.

QUICK QUIZ

Here's a quick quiz you can't fail! Just answer these three easy questions.

1. A revolution is . . .

   (a) the name of a galaxy.

   (b) the noise a car makes when it starts up.

   (c) a disco dance where you spin in circles.

   (d) a major change in any situation.

2. Agriculture means . . .

   (a) the science and business of cultivating land and raising livestock.

   (b) the science and business of producing crops.

   (c) the science and business of farming.

   (d) all of the above.

3. An agricultural revolution is . . .

   (a) a Star Wars battle among farmers.

   (b) an uprising of pigs and cows.

   (c) a revolting wheat crop.

   (d) a major change in the way farmers farm.

Milestones in American Agriculture

1793 ● Eli Whitney invented the cotton gin.

1825 ● Completion of Erie Canal opened western farmlands to European markets.

1833 ● McCormick reaper was patented.

1837 ● Steel plows were used in the prairies.

1849 ● Mixed fertilizers were first manufactured commercially.

1862 ● Morrill Land Grant College Act gave land to each state for colleges to teach agriculture and mechanical arts; Homestead Act gave 160 acres of federal land to each settler.

1875 ● First state-supported agricultural experiment station was established.

1892 ● Successful gasoline tractor was built.

1914 ● Smith-Lever Act formalized cooperative extension work on a national basis.

1916 ● Federal Farm Loan Act guaranteed payments of certain loans made to farmers.

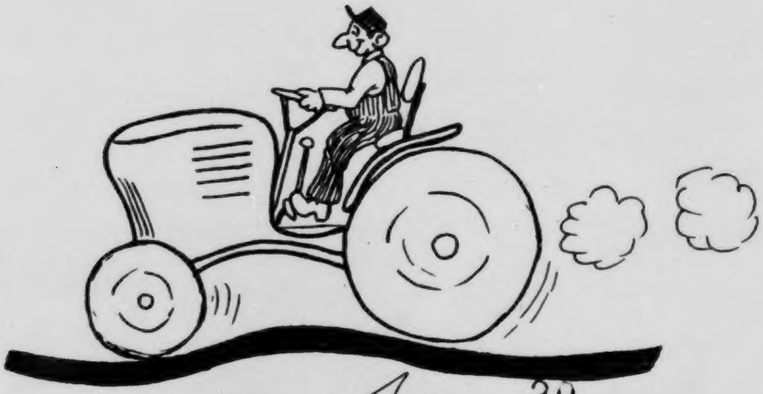
1926 ● Hybrid corn seed became commercially available.

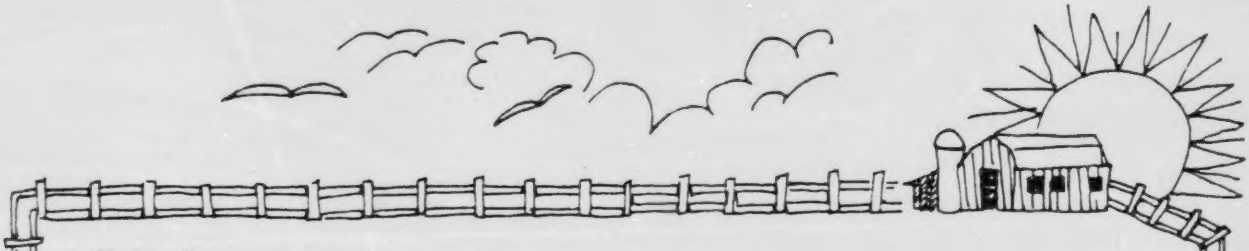
1927 ● Mechanical cotton picker was invented.

1937 ● Farmers Home Administration was established to help farm workers acquire their own land and to encourage the development of efficient farms.

1954 ● Public Law 480 established the use of surplus farm products for foreign relief and development.

1961 ● Introduction of Gaines short-stem wheat permitted big increases in output through the use of fertilizer and irrigation.





Unit 1
Chapter 2

EARLY AGRICULTURE IN IOWA

The land that now comprises Iowa had been occupied first by various nomadic tribes of the Paleo-Indian period perhaps as long ago as 12,000 years. They had come to this area to hunt the large game animals, the mammoth and the bison, which roamed the area. They were succeeded by nomadic hunters of the archaic period of 8,500 years ago, who in turn gave way to the Woodland Indians.

The land was relatively unexplored until on June 25, 1673 a French explorer, Louis Jolliet, accompanied by five voyageurs and a Jesuit priest, Jacques Marquette, traveled down the Mississippi River and stopped at the mouth of the Iowa River. Here they met the Illinois Indians. It was the first meeting between the white man and the Indians on Iowa soil.

The Midwest, including Iowa, remained under the rule of the French until 1763 when the French King Louis XV gave the land to his relative, the King of Spain. In 1801, Spain signed a treaty with France giving the land back to France. Napoleon in turn sold the land to President Jefferson in 1803. The price was fifteen million dollars--or about 4¢ per acre for the 885,000 square miles. The land was called the Louisiana Purchase.

President Jefferson wanted the unknown country explored so he asked Captain Meriwether Lewis to go up the Missouri River and across the country to the Pacific Ocean, exploring the vast new area. Captain Lewis chose William Clark to accompany him. They explored the Missouri River that is Iowa's western border, one hundred and thirty years after Jolliet and Marquette explored the Mississippi.

The man who probably saw more of Iowa, before it was settled, than any other person, was Captain Stephen Kearney. In the early 1820's he made three expeditions across different parts of our state. He observed the plants, animal life and the tribes of Indians. He found the land abundant with wolves, foxes, small fur-bearing animals, buffalo, prairie chickens, and water birds, and rattlesnakes.

June 1, 1833, was the first day the land of Iowa was officially opened to settlers. Even before dawn, settlers began the dash for the new land. They crossed the Mississippi any way they could; some pioneers crossed by floating their wagons while the horses swam alongside. The early settlers had only "squatters rights" to the land. A squatter was a person who staked out a claim on land which had not been officially surveyed. The land surveying started in 1836 but no actual land sales were held until 1838. The squatters ran the risk that their land might be sold to someone else. The government sold the land to the pioneers for $1.25 an acre.

Iowa led in the amount of land sold with military warrants with over 14 million acres. The policy of rewarding the defenders of the country with land bounties began with the Colonial Congress in 1776 when land was promised to the revolutionary soldiers and officers. The Act of 1847 related to those who served in the Mexican War and granted that with a minimum of 14 days of service or participation in one battle, one could qualify for a minimum of 160 acres in the form of a bounty land warrant. This warrant could be used in place of cash to purchase any land available for sale by the federal government to private entry. The bounty land warrants could also be sold on the open market. During the 40 year period when most of the land sales in Iowa were made, more military warrants than cash were used for large purchases.

Agriculture was the basis of the westward movement. Nearly all the pioneers were farmers. The Homestead Act of 1862 helped the pioneers obtain land. A family could acquire a free homestead of 160 acres. The only payment was a fee ranging from $26 to $34. Conditions had to be met before they could claim the land.

From about 1855 to 1878 approximately four and a half million acres were given to railroads to ensure completion of seven railroads. Many Iowa pioneers bought land from the railroads.

Isolation of the west influenced its early farming methods. Early settlers worked with a few simple tools, manufactured their tools and implements by hand, and consumed most of their products at home. Pioneer fields were often cleared of underbrush and small trees, but large trees were cut down within three or four feet of the ground and the stumps left standing.

Wheat was produced in every state. Wheat production moved westward with the settler. Wheat fit well into the farmer's economy. It was in demand everywhere, brought a price that justified hauling it long distances to a mill or market,

and it kept well. Its production was relatively inexpensive and primative tools for its production could be made by hand. By 1889, Iowa was the center of wheat production.

Corn was synonomous with farming. The settlers knew the Indians had raised corn and they planned to do the same. Corn was more resistant to disease and parasites than wheat, yielded more per acre and was a cheaper feed for livestock. It was a standard item in the settlers diet.

Cattle and hogs were also raised in Iowa. Henry Clay imported the first hereford cattle in 1817. The improvement of beef cattle changed the U.S. beef cattle industry. Hogs were often grazed in the woods and finished on corn. Improved breeds of hogs were also introducted at this time.

Although first used as a hay crop, soybeans emerged as a new and important oilseed crop during the 1930's. They were grown as a commercial crop in the Southeast but moved into Iowa in the 1920's and 30's.

Most farm implements used on the farm were the products of blacksmiths or neighborhood artisans. The efficiency of an implement was largely dependent upon the skill of its blacksmith. The plow was one of the implements made by the blacksmith. The thick heavy Iowa sod caused the settlers problems. The light, cast-iron plow could not readily cut through the soil; plowshares had to be replaced often; and the rough moldboard would not scour properly. Scouring is when the dirt does not stick to the plowshare. For a time, the farmers had to fall back on the cumbersome wooden plows with iron shares. These plows were heavy and required at least five oxen to pull it but they did not clog and would cut the sod. The first time the land was plowed, the plow only went two or three inches deep. This plowing killed the roots of the prairie grasses and left them to rot. Later the settler went over the soil again, making a deeper plowing. The settler could plow one to two acres a day. Improvements were quickly made on the plow.

At the beginning of the Civil War, America was still basically an agricultural nation. About half of the 31,400,000 population recorded in 1860 lived on farms; more than half of the gainfully employed worked on them; and three-fourths of the national exports came from them.

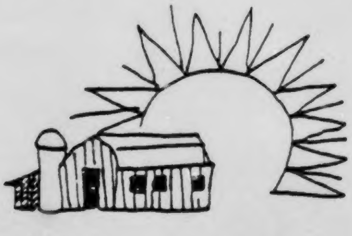
The Civil War developed a heavy demand for beef cattle and hogs. The War Department placed a heavy drain upon agriculture as they demanded more than one-half million horses and one-fourth million mules. Great Britain's dependence on northern wheat, operated as a contributing influence in keeping the British government officially neutral. After the war, a new wheat belt developed from Ohio to Iowa that depended upon foreign markets and the world price of wheat.

The Depression in the 1930's caused many Iowa farmers to lose their farms due to foreclosures by banks and insurance companies. Farm prices fell to all time lows, corn at ten cents a bushel, pork at three cents a pound and beef at five cents a pound. Many farmers were upset with the prices they received. The angered farmers fought for higher prices.

New advances in technology and production of crops have made today's Iowa farmers some of the most productive farmers in the world. Agriculture continues to change daily--everything from developing new varieties of seed corn to inventing a new type of combine.

SUGGESTED ACTIVITIES

1. Using TM-2, discuss how the settlers started farming. Compare to costs today.
2. Using TM-3, ask students what crops were grown in the pioneer days. Compare to what is currently grown in the state.
3. Visit the local museum. Have a resource person show the students the farm implements and discuss how they were used.
4. Visit the Living History Farms in Des Moines. They have special tours for 4th, 5th and 6th graders covering community living, food production, and a school house program. When you schedule your tour you will receive a teacher's guide book to help prepare the students for the tour. (Address in reference section.)
5. Have a senior citizen in the community come in and talk to the class about farming during the Great Depression.
6. Most home gardens are planted, weeded and harvested by hand. Ask students how they raise a garden. Compare this to what the early settlers did.



7. Using ACT-2, discuss how farm implements have changed over the years. Have the students draw a picture (magazine cut-outs can also be used) of what is currently being used for each of the implements shown. Put finished worksheets on display on the bulletin board.

8. Using INFO-3, discuss famous Iowans and the role they played in agriculture.

9. Using ACT-3, Famour Iowans, have the students match the famous Iowan to the symbol that represents him/her.

10. Have the students research what the Iowa farmer received for crops during 1910-1914 to what is received now. Compare food prices then and now.

11. Using INFO-4, Milestones in Iowa Agriculture, discuss how Iowa agriculture fits into the Milestones in American Agriculture.

12. Show the filmstrip "Iowa Farming in 1900," available from your AEA.

IN 1846, A PIONEER COULD START FARMING WITH $400

$400 would provide:

- a comfortable log cabin
- 30 weeks provisions
- farming utensils
- a good yoke of oxen
- a cow, a horse
- 12 sheep

IN 1889
IOWA WAS THE CENTER OF WHEAT PRODUCTION

Iowa was also a major producer of corn and beef cattle

THEN AND NOW

Farm practices and equipment have changed over the years. Iowa agriculture has become more efficient and more complex. One farmer today can do more work in an hour, because of machines, than one pioneer farmer could do in a week.

Can you draw what is currently used?

PIONEER FARMER ***MODERN FARMER***

Scythe ***Combine***

Hoe ***Cultivator***

PIONEER FARMER	***MODERN FARMER***
 Team of horses	***Tractor***
 Windmill	***Electricity***

Iowans in Agriculture

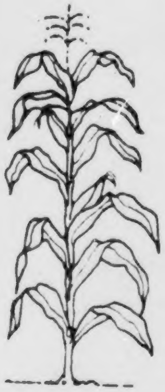
NORMAN E. BORLAUG has long been an internationally known agricultural scientist. He was born near Cresco, Iowa in 1914. Dr. Borlaug is a plant geneticist who developed a "miracle" strain of wheat that greatly benefited the underdeveloped nations because it could withstand adverse growing conditions (especially drought). In 1970 he received the Nobel Prize for Peace for his efforts in world food production.

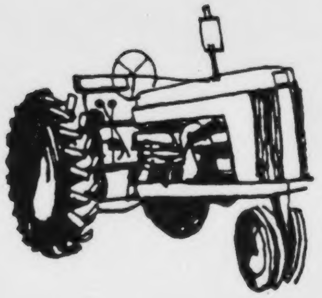
GEORGE WASHINGTON CARVER graduated from Iowa State College as one of the most outstanding scholars. He served as a faculty member at Iowa State for two years. Invited by Booker T. Washington to head the Tuskegee Institute in Alabama, Carver left Iowa. He gained fame for his agricultural research and helped revolutionize farming in the South. Carver was also an inventor. He invented more than 200 ways to use the peanut and developed 118 products from sweet potatoes. In 1939 he received the Roosevelt medal for his work in science and agriculture.

JESSIE FIELD SHAMBAUGH, as a teacher in a one-room school in Page County, held special classes for her students called the "Girls Home Club" and the "Boys Corn Club". Miss Jessie attended Tabor College and was elected Superintendent of Schools in Page County in 1905. As Superintendent, she organized Home Clubs and Corn Clubs in every school in the county and encouraged students to work on special projects. She was recognized as the "first woman in the U.S. who was interested in agricultural education". People referred to the clubs as "4-H clubs" and the name stuck. Jessie has been called the "Mother of 4-H" and the movement has grown to be one of the largest youth organizations in the world.

HERBERT HOOVER was born in West Branch, Iowa in 1874. He served as Food Administrator during World War I, Secretary of Commerce under President Harding and became the thirty-first President of the U.S.in 1928. While President he established the Federal Farm Board to organize cooperatives and provide money needed to store and hold grain until the market was favorable enough to sell.

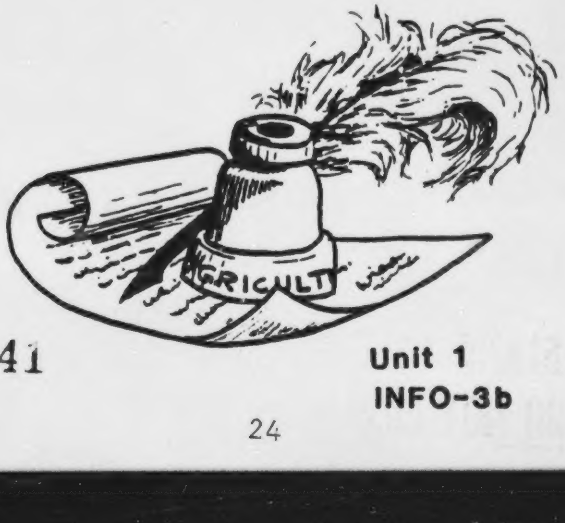
ROSWELL (Bob) GARST was a farmer-salesman from the Coon Rapids area who pioneered in the adoption of hybrid seed, fertilizer, and cattle feeding. He and Henry A. Wallace worked on hybrid seed corn and established Pioneer Seed Corn Co. to sell the product. Soviet Premier Nikita Khrushchev visited Garst and his farm in Iowa in 1959. It was Khrushchev's only stop in rural America.



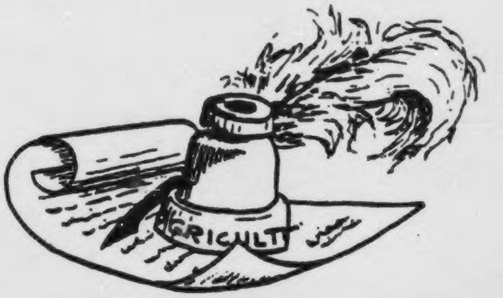


JOHN FROELICH built the first gasoline tractor which could propel itself backward and forward. In 1894, he formed the Waterloo Gasoline Traction Engine Company to build a practical gasoline tractor. In 1913, after three attempts, the company became a success. Then, in 1918, John Deere and Company bought the Waterloo Company. His idea grew into the largest wheel tractor manufacturing plant in the world.

HENRY A. WALLACE, the son of Henry C. Wallace, served as Secretary of Agriculture from 1933-40 under President Franklin D. Roosevelt. In 1940 he was elected Vice-President. He served as Secretary of Commerce under President Harry Truman. Mr. Wallace also pioneered the breeding of hybrid corn in the 1920's.

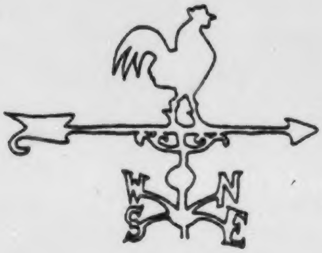


HENRY C. WALLACE, editor of "Wallace's Farmer", was appointed Secretary of Agriculture in 1921. He served until 1924 under President Warren Harding.



THOMAS D. FOSTER brought Morrell & Company, one of the largest meat packing plants, to Iowa. In an attempt to be nearer to the place where fine beef cattle were raised and fascinated with the Indian origin of "Ottumwa", Foster decided to locate Morrell Packing in Ottumwa, Iowa.

JAMES "Tama Jim" WILSON, an outstanding farmer and professor of agriculture served as Director of the Agricultural Experiment Station at Iowa State College. Later, while Secretary of Agriculture under President McKinley, 1897-1913, he set up experiment stations across the country, enlarged the U.S. Department of Agriculture, and set up the Weather Bureau as a service to farmers. The Pure Food and Drug Act, 1906, which requires all meat, food and drugs to be inspected and tested before they are sold to the public, was a result of his efforts.



EDWIN T. MEREDITH served as Secretary of Agriculture, 1920-21, under President Woodrow Wilson. As publisher and editor of "Successful Farming", he became a millionaire. He also published "Better Homes and Gardens". Meredith worked with the first 4-H clubs and was shairman of the National Committee on Farm Boys and Girls Club Work.

FAMOUS IOWANS

QUICK QUIZ

LET'S SEE HOW MUCH YOU CAN REMEMBER ABOUT IOWANS WHO HAVE PLAYED A BIG ROLE IN IOWA'S AGRICULTURE. MATCH THE NAME WITH THE IMPORTANT CONTRIBUTION BY DRAWING A LINE FROM THE NAME TO THE CONTRIBUTION.

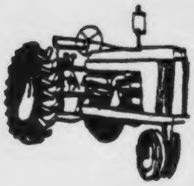
EDWIN T. MEREDITH

GEORGE WASHINGTON CARVER

HENRY A. WALLACE

JESSIE FIELD SHAMBAUGH

JOHN FROELICH



HENRY C. WALLACE

THOMAS D. FOSTER

HERBERT HOOVER

JAMES "TAMA JIM" WILSON

NORMAN E. BORLAUG

ROSWELL (BOB) GARST

Milestones in Iowa Agriculture

1838 ● First public auction of land (sold for $1.25 per acre) took place.

1854 ● First Iowa State Fair (encouraged farmers to raise better cattle) was held.

1862 ● Iowa State became the first college to accept provisions of Morrill Land-Grant Act.

1868 ● One-third of the tillable land in Iowa was under cultivation.

1869 ● Iowa State College of Agriculture and Mechanic Arts was formally opened (the 2nd Ag College to permit girls to be enrolled as students, first class had 173 students - 37 girls).

1877 ● Morrell and Company was established. It was a slaughtering and meat processing plant.

1880 ● Railroad tied Iowa both to the north and to the south giving Iowa one of the most complete railroad systems in the United States.

1881 ● The State Alliance was established. It united the various farm organizations.

1884 ● "Silver King" open-pollinated hybrid corn was produced and introduced by A.J. Goddard of Fort Atkins, Iowa.

1887 ● Iowa Experiment Station was established to promote scientific investigations and distribute practical information.

1890 ● Jessie Field Shambaugh (founder of America's 4-H Clubs) established the "Girls Home Club" and the "Boys Corn Club".

1892 ● Froelich invented the first gasoline-powered engine for threshing grain. It replaced the steam engine.

1894 ● Froelich formed the Waterloo Gasoline Traction Engine Company to build a practical farm tractor.

1896 ● The Waterloo Company built a tractor and offered it for sale.

1896 ● James "Tama Jim" Wilson was appointed Secretary of Agriculture under President McKinley.

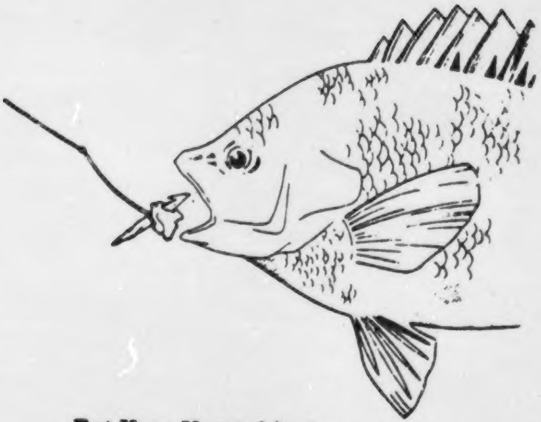
1900	The Iowa Department of Agriculture was established
1902	Perry G. Holden, Iowa State College, conducted field demonstration tests on corn yields.
1910	The first Dairy Cattle Congress was held in Waterloo.
1910	Iowa State Experiment Station began work on the soybean. They tested over 3,000 varieties and strains brought in from China.
1912	Holden and Martin L. Mosher, Iowa's first county agent, demonstrated benefits of careful seed selection and persuaded farmers to turn to seed companies for scientifically developed and tested seed.
1912	Alfalfa became a popular crop.
1918	John Deere and Co. of Moline, Illinois bought the Waterloo Company. It is now the largest wheel tractor manufacturing plant in the world.
1920	Edwin T. Meredith of Iowa was appointed Secretary of Agriculture under President Woodrow Wilson.
1920	Henry A. Wallace and Roswell Garst established the Pioneer Seed Corn Company. It moved hybrid corn into the commercial field.
1921	Henry C. Wallace of Iowa was appointed Secretary of Agriculture under President Warren G. Harding.
1928	Herbert Hoover, a native of Iowa, was elected President.
1932	The first hybrid seed corn from Iowa State College went on the market.
1933	Henry A. Wallace of Iowa was appointed Secretary of Agriculture under President Franklin D. Roosevelt.
1940	The first soil conservation district was established in Iowa.
1940	Henry A. Wallace of Iowa was elected Vice-President of the United States.
1965	Area colleges developed in Iowa, new concept to reach farm people and others in local communities.
1968	First check-off instituted in Iowa as means of promoting commodities.
1970	Living History Farm created...now a national attraction.
1970	Norman E. Borlaug of Iowa received the Nobel Prize for Peace.
1980	Iowa is first in both corn and soybeans for the first time.
1982	Iowa leads all states in farm exports...$3.7 billion.

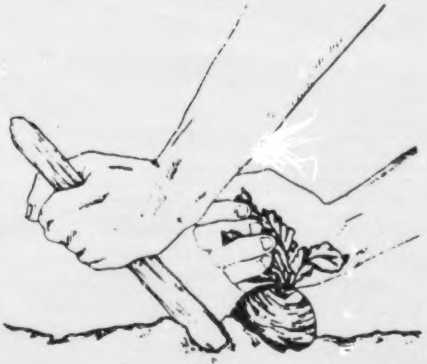
FOOD FACTS

A Fishy Story

People have been fishing for a long time. About 25,000 B.C., people started using bait on a bone fastened to a line. This was called a fishing gorge. Fish would take the bait, and the gorge would become stuck in the fish's mouth.

Later, people learned to carve hooks from the bones and horns of animals.





Eat Your Vegetables!

Kids in the United States have heard their parents tell them that for years.

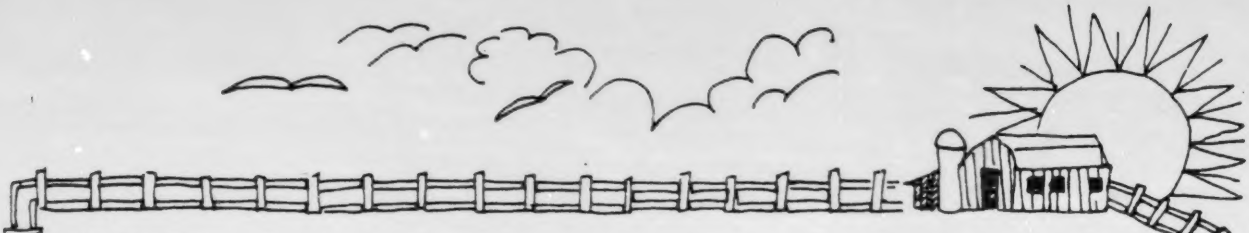
But back in prehistoric times, that was something parents probably never had to say. That's because vegetables were an important part of their diet.

Wild turnips, onions, and radishes are some of the root vegetables that people dug up millions of years ago. They also searched for other vegetables that grew wild aboveground, such as squash, cabbage, and mushrooms.

Insects: Yum!

You're probably saying to yourself, "Insects: ugh! Who would eat them?"

But thousands of years ago, insects were a favorite food. In fact, prehistoric people liked the taste of some insects so well that a few kinds were almost wiped out. And even today, many people in India and Africa still eat certain kinds of insects.



Unit 2
Chapter 1

A SALUTE TO THE FARMER

Thanks to advanced technologies and labor-saving equipment, today's farmers are working fewer hours and producing more. Farmers produce enough food to feed the growing United States population and also export an equivalent of 90 million acres of cropland as well.

In 1950, there were 2½ times as many farmers as there are today yet agricultural output is double that of 30 years ago. The amount of farmland has stayed about the same even though there are half as many operating farms now as there were in 1950. Over 55 percent of farmland sold is bought by farmers to enlarge their own operations. In 1950 the average farm was 213 acres. Today, it's 385 acres. The size of farms has increased to better utilize costly new machinery and to reduce the cost per unit of production.

Today's farmer is more efficient than his 1950's cousin. Mechanization, improved varieties of crops and livestock, increased crop production by over 60 percent per acre. Larger tractors, nearly twice as powerful as those used 3 decades ago, as well as other labor-saving equipment, have boosted the output per hour of work by 275 percent. This output per man-hour in agriculture has increased at a rate of nearly 6 percent a year compared with 2½ percent for all other industries.

This use in agricultural productivity means fewer workers are needed to produce our food thereby releasing workers to other sectors of our economy. In our country, there are 53 people for every 1 employed on farms. In less developed countries like India and Pakistan, there are less than 4 persons for every farmworker. Agricultural efficiency has helped raise the United States standard of living by providing abundant food at low cost in relation to our take-home pay, leaving us more income for other things--houses, cars, college educations, etc.

Farmers have created many jobs for the non-farm sector of our economy. Each year, farmers spend more than $60 billion for goods and services to produce crops and livestock. Another $15 billion is spent for the same things that city people buy--food, clothing, and other consumer products and services.

Increased efficiency has also tended to close the gap between the farm and nonfarm family's per capita income. In the 1950's, the income per capita of the farm population was less than 55 percent of nonfarm, in the 1960's about 65 percent, and in the 1970's 75 percent.

Each year approximately 4.3 million persons apply their labor and skills to produce nearly 200 different kinds of crops, hundreds of millions of head of livestock, and billions of poultry. All of this results from the individual decisions of nearly 3 million farmers who decide what crops to produce, how many acres to devote to each, and how much livestock to raise. Farm operators, their wives and children turn these decisions and efforts into a reality. Farming is the only major industry in the U.S. in which family members make up the largest share of the labor force.

Farm sizes range from the small family farms of a few acres to very large farms of a thousand acres or more owned by individuals, cooperatives, or corporations and operated by managers and hired labor. Some of these commercial farms have an almost factory-type system of operation. Corporate farm arrangements, however, account for only 1 percent of the farms and 14 percent of the output.

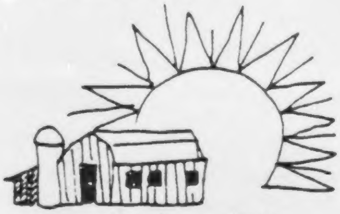
Farms also differ in what they produce and where they produce it. The kinds and amounts of crops and livestock vary by region. Soil conditions, climate, and even how far it is to the nearest or best market, influence decisions on what and how much to grow.

SUGGESTED ACTIVITIES

1. Using background material provided introduce the following facts:

   --A single bushel of wheat produces about 47 loaves of bread.
   --An average dairy cow produces about 62 glasses of milk each day.
   --One chicken lays about 240 eggs a year.
   --One apple tree yields enough apples to make about 280 apple pies each year.
   --A calf born today will be ready for market as a beef animal in two years.
   --About half of the world's total supply of corn is grown in the United States.

2. Before distributing ACT-1, help students think of some common foods processed from farm products. Make a listing of the foods on the chalkboard.



3. To prepare students for the "Great Food Hunt", ACT-1, solicit answers to the following questions:
   a) Most of you ate something yesterday or today that came from an animal. Do you know what it was? (red meat, poultry, milk, eggs, cheese, etc.)
   b) Did anyone eat something that came from a tree? (oranges, apples, pears, peaches, nuts, etc.)
   c) Did anyone eat something that was dug up from the ground? (potatoes, carrots, radishes, turnips, etc.)
   d) Most of you ate something made from seeds. Can you think what it was? (bread, rolls, donuts, cakes, buns, etc., from the seeds, or grains, of wheat)

4. Distribute activity sheets and ask students to look in their kitchens at home to find some processed food products that fit the descriptions on their sheets. Post wall chart after students have completed their sheets. Check answers drawing students' attention to the wall chart.

5. You may want to introduce additional information about productivity when discussing the bottom half of the sheet.

6. Before distributing ACT-2, discuss farming as a business. Additional background information can be obtained from the instructional sheet (activity master 2).

7. Make a list on the chalkboard of some of the things a farmer might spend money on during the growing season.

8. Distribute ACT-2. Give students plenty of time to complete sheets. Dividing the class into small groups could help individual students think questions through more thoroughly.

9. After students have completed the sheets, compare and discuss answers.

10. Using TM-1, discuss why more money goes to the farmer for hamurger than for bread. (Hamburger takes less processing; therefore, there are fewer handlers between farmer and consumer who must be paid for their labor.)

ACTIVITY MASTER 1

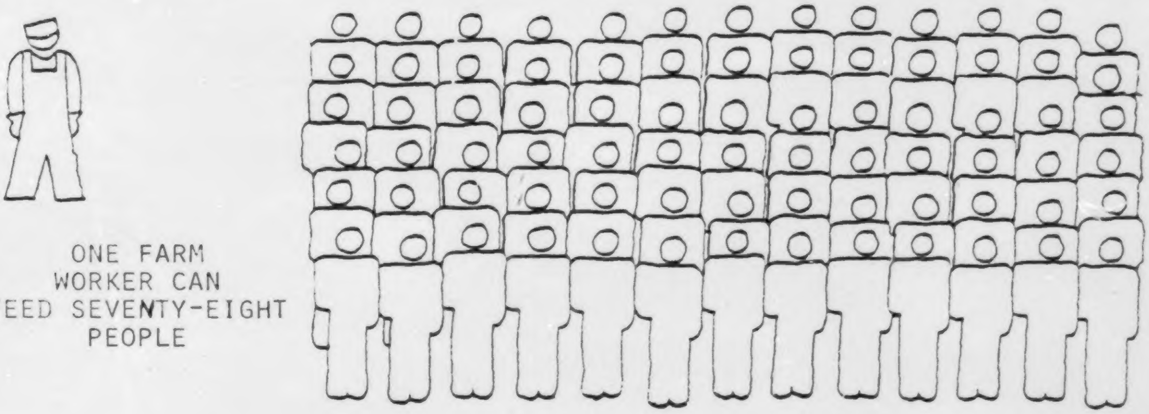
The great food hunt

Be a food detective. Look for the foods described below on your kitchen shelves or in the refrigerator. Write the names of the foods on the lines. Ask your mother or father to go along as your helper.

1. Something made from wheat
2. Something from a dairy cow
3. Something from a chicken
4. Something from a tree
5. Something from a hog
6. Something from a steer
7. Something from corn
8. Something that grew under the ground
9. Something made with tomatoes
10. Something green

Who supplied the food you searched for on your hunt? The farmers of America. Farmers work hard to grow food. In the United States today, one farm worker can supply enough food for 78 people. Just 10 years ago, the farmer could feed 39 people. Why can farmers do so much better now? Put a check mark by the things you think could be reasons.

- ☐ They have better kinds of plants to grow.
- ☐ Bigger and more powerful machines can do more work.
- ☐ Farmers work longer hours than they used to.
- ☐ Special foods help animals grow faster.
- ☐ Chemicals do more of the work on the farm.
- ☐ The weather is better nowadays.

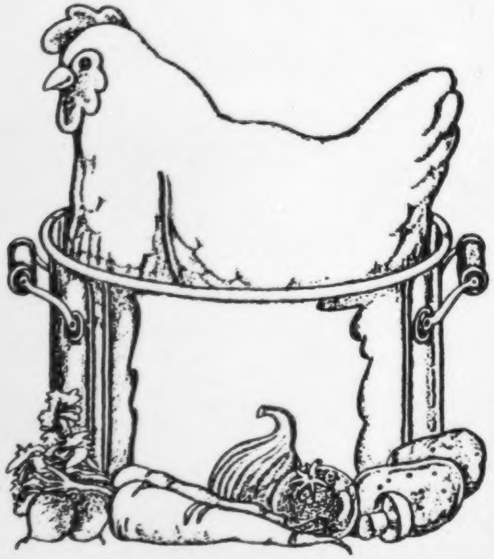

ONE FARM WORKER CAN FEED SEVENTY-EIGHT PEOPLE

Activity from the Great American Farm

ACTIVITY MASTER 2

What it costs to raise food

It costs the farmer money to raise food. The farmer has to know how to manage his business wisely. To the right you see the words of six farmers as they talk about their expenses. Try to figure out what kind of farm each speaker has. Put the kind of farm in the blank space. Some kinds of farms are in the box below.



To make my ______________ grow big and healthy, I need to buy or grow the right feed.

At this time of year, I need to hire extra hands to help pick the ______________ that get ripe all at once.

I had to borrow money to build a milking parlor, but it sure makes ______________ more efficient. I pay interest on that loan every month.

If I expect hens to lay a lot of ______________, I have to keep their house in good shape. New housing and equipment are expensive.

It takes a lot of land to grow the ______________ used to make jeans and shirts, and I pay taxes on every acre.

We count on good harvests of ______________ and soybeans to help feed Americans and people in other countries. To raise enough of these crops I need to buy the right fertilizer and enough of it.

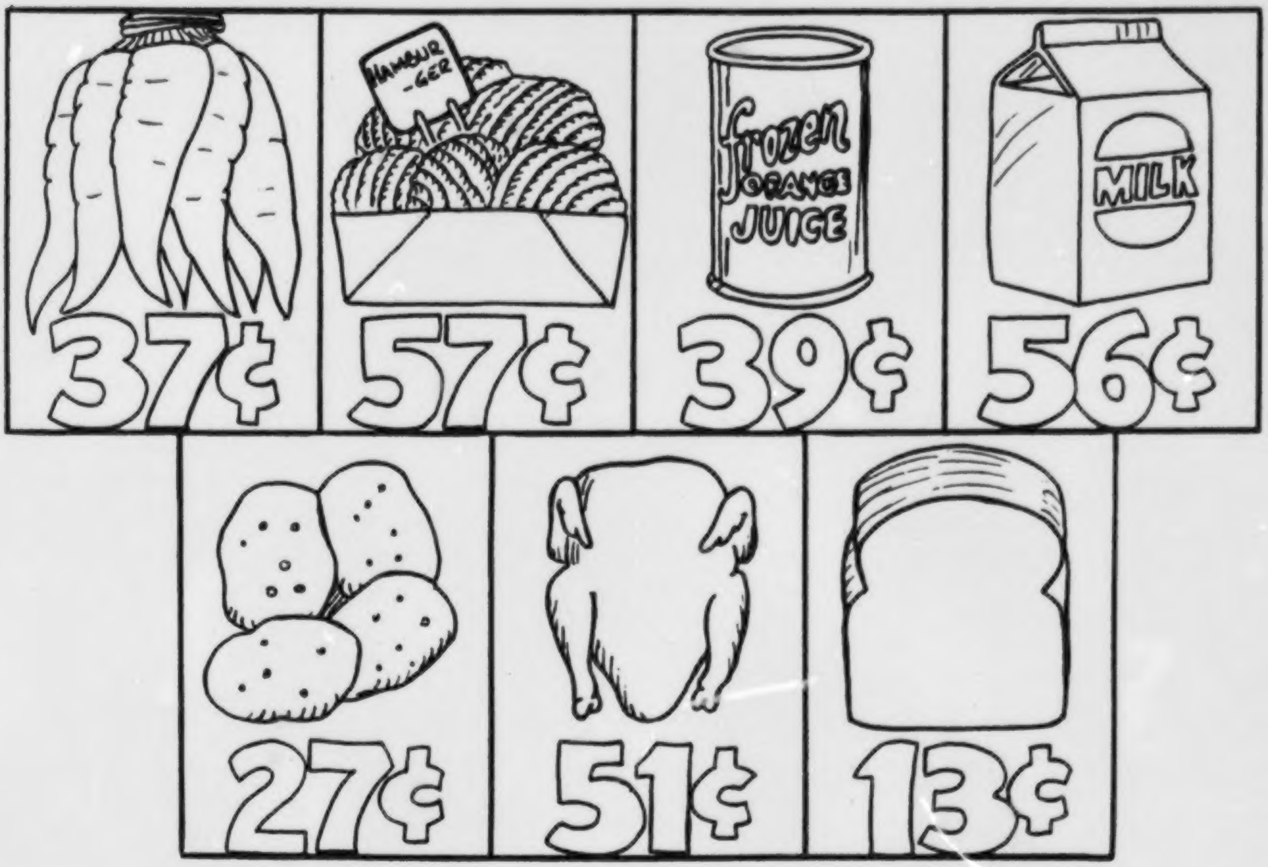
dairy farming
eggs
cotton
livestock
grains
vegetables and fruits

Now make a list of the expenses that farmers have to meet every year. Get your information from the six examples to the left.

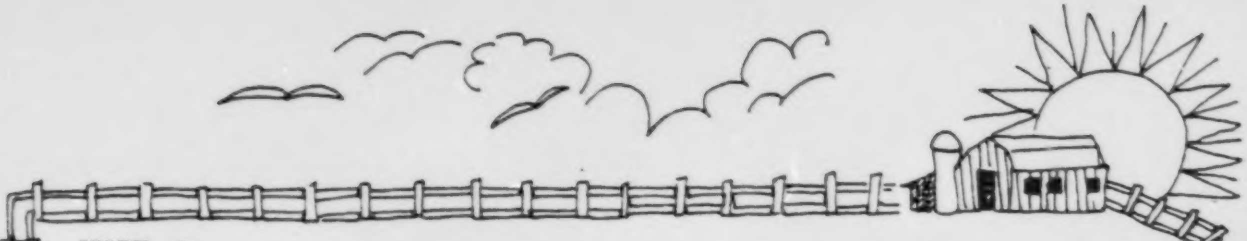
1. ______________
2. ______________
3. ______________
4. ______________
5. ______________
6. ______________

Activity from the Great American Farm

This is what the farmer receives from every dollar you spend on these farm products:



Why do you think the farmer receives more from hamburger than from bread?



UNIT 2
Chapter 2

R-E-W-A-R-D-S OR R-I-S-K-S

The Great Farming Gamble

Today's farmers may have several hundred thousand dollars invested in their farm. For example, for some typical farming operations it may take $321,000 for a 1,950-acre Kansas wheat-sorghum farm; $200,000 for a 360-acre Louisiana rice-soybean farm; $796,000 for a 385-acre Iowa corn-soybean farm; and up to $611,000 for a 200-acre California vegetable farm. The largest share of the farmer's investment is in land. Many beginning farmers start farming by renting their land, since they cannot afford to buy it.

A farmer must sell enough farm products to pay for expenses, provide the family with a minimum standard of living, and provide some return on investment. Not all farms produce enough to pay all expenses and provide money for the family income. These are often part-time operations or retirement residences. On the other hand, some large farms bring in hundreds of thousands of dollars a year and provide income for several families.

Farms with $10,000-$20,000 product sales account for 10 percent of sales and 13 percent of the farms. Income from these farms does not provide much more than minimum living standards and little or no return on investment. The rest of the farms, approximately 700,000, have gross sales of $20,000 or more, and account for 80 percent of all farm product sales. More than 70,000 of these farms have sales of at least $100,000 a year. These farms represent only 2 percent of the farms but have 38 percent of the sales--including 55 percent of all poultry and poultry products and 70 percent of our vegetables.

Farming has become more specialized. Today's farmer raises fewer kinds of crops or livestock, buys more seed and feed and uses more mechanical equipment such as tractors and milking machines than farmers in the past. This specialization requires a high degree of skill and knowledge of genetics, land and water conservation, and business management. The specialized farmer performs many different jobs with complex tools and machines to combine science and machine power with the ancient art of tilling the soil. While farming still demands plenty of hard work and mechanical and technical skills, management has become more complex. With hundreds of thousands of dollars invested in land, machinery and stock, managing the production, marketing and financing demands more education and training than was the case some decades ago.

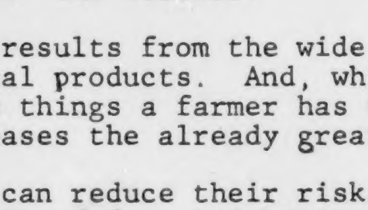
Along with greater productivity, farmers of the 1980's have larger expenditures. Adopting all the modern technology available has been expensive for the present-day farmer. They purchase 70 percent more feed, seed and livestock, and 3 times as much chemicals, fertilizers and pesticides. They have 7 times more real estate debt and 5 times more non-real estate debt than 3 decades ago. As the farming operation gets bigger, the farmer must purchase more fertilizers, pesticides, gas and oil, and other nonfarm goods. And the larger the farm, the more hired workers the farmer has to pay. The farmer also is a large purchaser of tractors, trucks, automobiles and other equipment. Farmers buy about 1 of every 8 trucks that are sold in the United States.

Crop production is not a continuous process so farm income can fluctuate widely from year to year, and even from season to season. Generally, the crop production covers a period of only a few months in which crops can be badly damaged by weather, insects, or disease. Farmers have almost no control over how much their farm will produce once the crop is planted ... almost no other industry is so dependent on such an unpredictable and widely variable factor--the weather.

Income variation results from the wide swing in prices common for agricultural products. And, while prices may fluctuate widely, prices of the things a farmer has to buy tend to go up steadily. This increases the already great risks.

One way farmers can reduce their risks is through contract farming. Various forms of farm and business arrangements have existed for a long time in commerical fruit production. Contract farming now accounts for about two-thirds of the vegetables produced for canning and freezing. Contract farming is when the farmer agrees to produce crops or livestock for a company. The company furnishes the seed or animals and the farmer provides the labor and facilities. Most of today's turkey and broiler production is a joint undertaking between farmers and processors. This not only can reduce their risks, but is also a way of guaranteeing their income.

Farmers can also reduce their risks by using the futures market. The farmer deals both in the future market and in the cash market to minimize his/her loss. When the livestock or crop is young, a contract is sold on the Chicago Board of Trade for



later delivery. When the crop or livestock is ready for market the farmer buys back the contract on the futures market and sells the crop or livestock in the cash market.

As energy prices continue to increase, so will the cost of farming. Agriculture uses substantial amounts of energy, both directly to run farm equipment and indirectly in the manufacture of such inputs as fertilizers which have helped raise the the productivity of American farmers to such impressive levels.

Both farmer and marketer are dependent on consumers, whose demands are expressed by their food purchases. Consumers, through demand, ultimately determine what food products will be produced, in what quantities, and how much will be paid for them. Consumers, particularly city-dwellers, depend entirely on the farmer and the marketer for supplies of products.

The rapidly growing population who has more money to spend, eats a wider variety of foods, but produces less for themselves, has placed a great demand upon the farmer. At the same time, there has been a change in the kinds of diets people choose to keep themselves in good health. Consequently, the average American's diet today consists of a greater variety of farm products than in the past.

Given favorable product prices, more general use of technology, adequate supplies of inputs, and no restrictions on land use, farmers have the potential capacity to vastly increase output of major agricultural products. These increases will depend upon the incentives farmers have.

Challenges in the past have made today's farmers and their farms the envy of the world. Farmers will continue to face the challenges of changing technologies. They will face the national challenge of improving our environment and overcoming shortgages of energy. Just as the Revolutionary War soldier-farmer would not recognize the tools and technology used by today's farmers, we can expect as great a change in the next 200 years.

SUGGESTED ACTIVITIES

1. Using ACT-3 and 4 simulate decision making by farmers and the risks they must face in their businesses. Follow instructions under "My Farm Diary".

2. To assign risks, let each student spin a spinner to determine his/her assigned risk. Trace the outline of a spinner onto a piece of cardboard and cut it out. Use a straight pin to affix it to the Great Risk Wheel and allow each student to spin it to determine his or her risk.

3. Invite a local farmer or county agriculture extension agent into your class during the day on which students complete their farm diaries. Discuss with the students what it's like to be a farmer.

4. Ask students to read articles on farming in encyclopedias and other reference books and to list as many 'risks' as they can. Discuss and compare these lists.

5. Using ACT-5, "Let's Go To Market", ask students to help Eddy and Linda Johnsen market their steers and hogs. Ask students to obtain current prices for steers and hogs from a newspaper market listing or assign a student to call a local livestock market to obtain current prices. A listing of livestock markets for your area may be found in the yellow pages under "livestock".

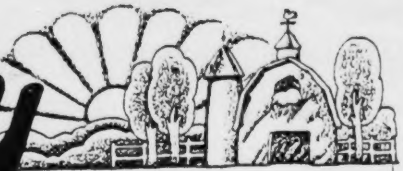
6. Using INFO-1, let students read and familiarize themselves with market prices and products in 1933. Compare products for then and now. Obtain a copy of an old copy of your local paper. Check for copies in your local library.

7. Using ACT-5, let students refigure worksheets using 1933 prices for steers and hogs. Compare prices.

8. To familiarize students with the marketing process (weighing, immunizations, testing, selling procedure), arrange a field trip to a local livestock market.

ACTIVITY MASTER 3

My farm diary



Be a farmer for a day. Fill in the blanks on these two pages.

1. I am one of the 4.3 million farmers and farm workers whose work feeds more than 200 million Americans and many more people overseas. I got to be a farmer by

____

2. I work on an average-size farm. That is about 350 acres. An acre is about the size of a football field. A football field is _____ yards long and _____ yards wide. Different kinds of farms are different sizes. You can produce a lot of chickens on 150 acres. A cattle ranch in the West would run to thousands of acres.

3. I produce (underline one)

oranges
milk
broilers
potatoes
hogs

corn
eggs
beef cattle
tomatoes

peanuts
wheat
soybeans
apples

4. The name of my farm is

____

5. To raise my product, I live in the state of

____

I can't easily raise oranges in Maine or apples in Nevada because

____

____

6. My product is used to

____

Keep a record of your work for a year by answering the following questions. You already have a product. Work out answers to these questions to see how successful you will be at the end of the year. Remember, your success and the success of others like you will mean a lot to the world.

7. My ordinary expenses
for the year are.......................$________________.

Every farmer has ordinary expenses that can be planned for. The farmer has a good idea what they will be when the year begins. To find out how much your ordinary expenses are, look at the list of products below.

Your ordinary expenses are $28,500 for cattle; $172,500 for dairy products; $228,000 for eggs; $6,100 for broilers; $20,100 for hogs; $76,200 for corn; $48,175 for soybeans.

Your ordinary expenses are $63,400 for oranges; $70,000 for potatoes; $68,000 for apples; $5,700 for peanuts; $179,200 for tomatoes; $20,800 for wheat.

8. My unexpected expense
for the year is..........................$________________.

Almost every year something happens that the farmer has not planned for. This costs extra money. The farmer might have to pay for a repair. To find out your unexpected expense, see the wall chart.

9. The cost of my risk is ....$________________.

As a farmer, you face risks. Things happen that you cannot control. Sometimes these things cost you money. To find the cost of your risk this year, see the wall chart and the Great Risk Wheel.

Activity from the Great American Farm

ACTIVITY MASTER 4

My farm diary

10. What I get for my product $____________.

If you produce cattle you sell for $20,000; dairy products for $155,600; eggs for $246,000; broilers for $10,100; hogs for $25,800; apples for $77,000.

If you produce oranges you sell for $60,600; peanuts for $11,900; tomatoes for $200,000; corn for $90,000; soybeans for $48,600; wheat for $32,000; potatoes for $100,000.

MY INCOME
(What I get for my product) ....$____________

MY TOTAL EXPENSES
(What I paid out) ....$____________

MY PROFIT OR LOSS FOR
THE YEAR...............................$____________
(If a profit, use black ink; if a loss, use red)

Sometimes I make less on the things I grow than it cost to produce them in the first place. And I almost never have much cash left over after paying expenses, paying for the value of my labor and management abilities, allowing for depreciation of the buildings and equipment on the farm, or paying myself something for the value of the land. As a farmer, in fact, I do not earn the kind of return on my investment that businessmen take for granted.

THE MEANING OF MY SUCCESS

When I can produce more food and sell more food—to your family and to families who live in other countries—things are

☐ better
☐ worse for all of us.

Your food should cost ☐ more
☐ less

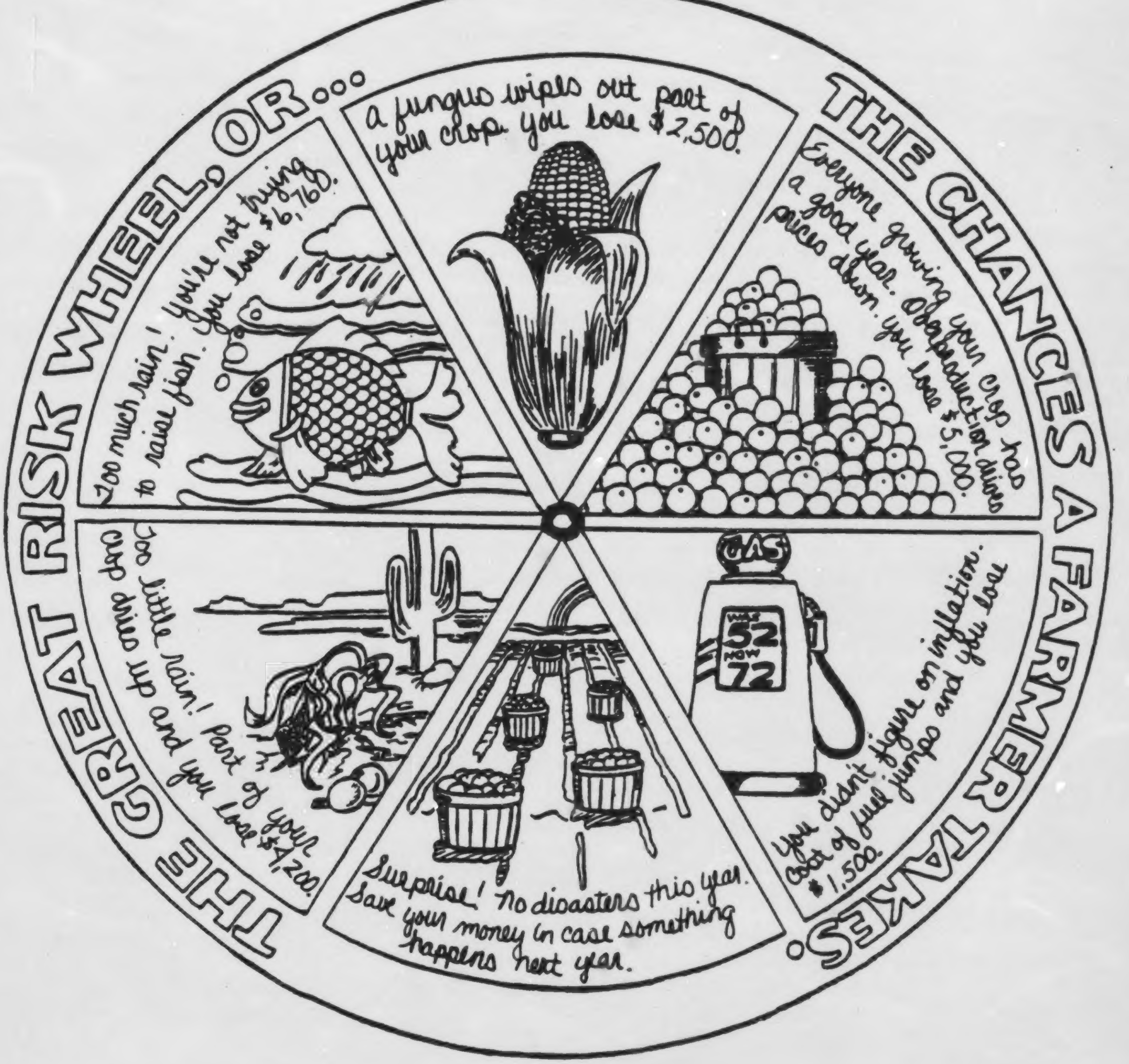
because I can produce it more efficiently. Other people have more to eat than they might otherwise. And I make

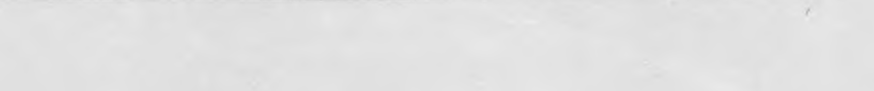
☐ more
☐ less

money because I can sell more of what my farm can produce and sell it at a good price. So, don't be too sad if rain keeps you indoors on a summer day. Remember, the rain may help me produce the food that will show up on your table in time.

Activity from the Great American Farm

Farming is a very risky business. Try your luck at farming. Color the wheel. Cut out the spinner and attach to the wheel. Spin to see if you can make it Farming.


THE GREAT RISK WHEEL OR...
THE CHANCES A FARMER TAKES.
A fungus wipes out part of your crop. You lose $2,500.
Everyone growing your crop has a good year. Overproduction drives prices down. You lose $5,000.
GAS
WAS 52
NOW 72
You didn't figure on inflation. Cost of fuel jumps and you lose $1,500.
Surprise! No disasters this year. Save your money in case something happens next year.
Too little rain! Part of your crop dries up and you lose $4,200.
Too much rain! You're not trying to raise fish. You lose $6,760.



Some unexpected farm expenses.

1. Borrow to install irrigation equipment. Cost will be $5950 per year.

2. Tractor cannot be repaired. You must borrow to buy a new one. Cost will be $9750 per year.

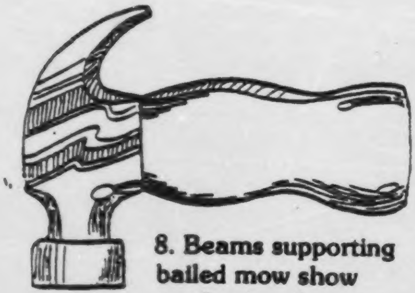
3. Your crops do so well that you must hire extra hands for a time. Pay $2000 in wages.

4. A piece of land you need is for sale. You borrow money from the bank to buy it. Cost is $7500 per year.

5. A tire blows out on the truck. Pay $85 for a new tire.

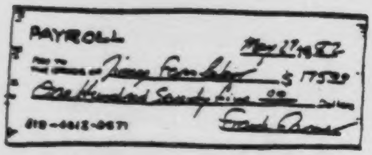
6. Cow is injured in fall and must be destroyed. Cost $850 (market value of cow).

7. Wind blows down and damages three temporary silos. Replacement costs $912 in materials and labor.



8. Beams supporting bailed mow show weakening. It costs $1810 to replace them.

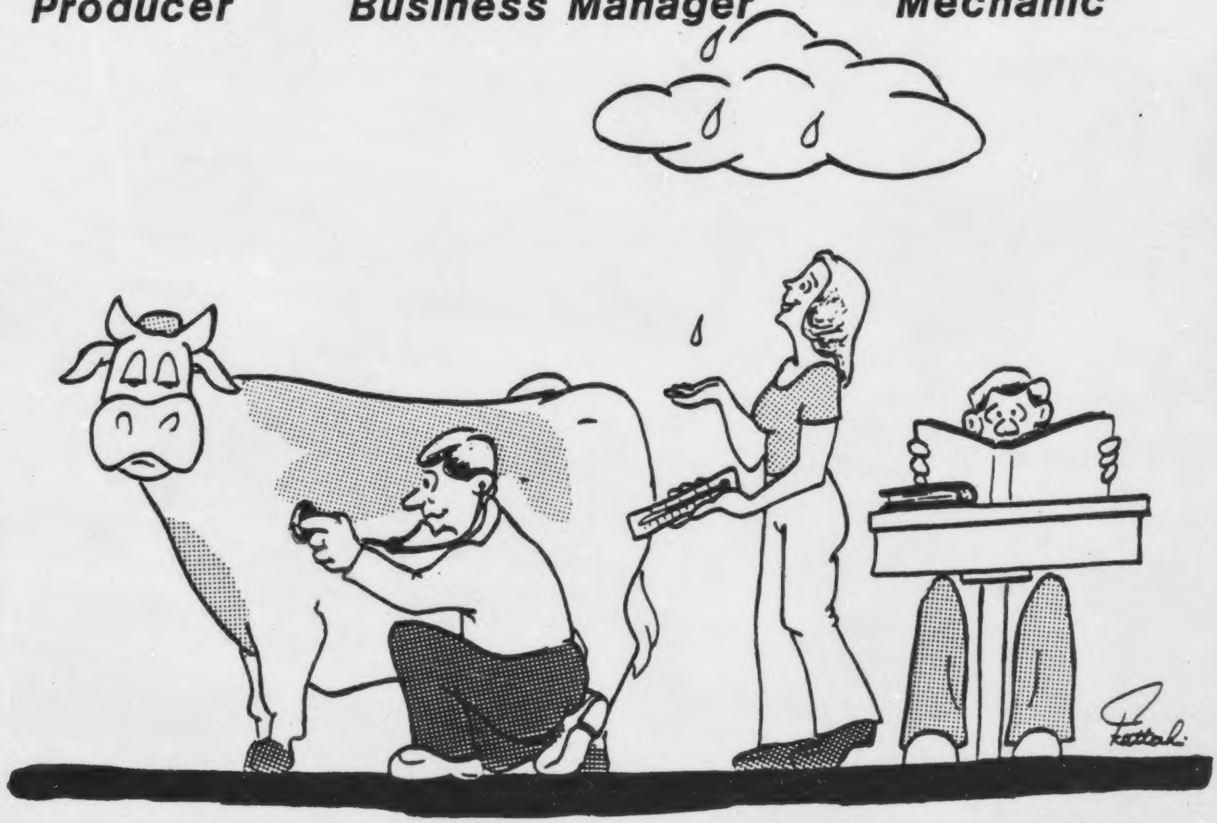
9. Heavy rains wash out two crop terraces. Repair the damage for $1100.



10. Cost of extra help during peak harvesting period comes to $2100.

THE FARMER'S MANY ROLES

Producer **Business Manager** **Mechanic**



Veterinarian **Meteorologist** **Student**

How much food do you eat in a year?

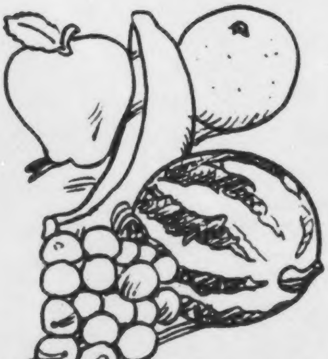
An average American eats every year:

155.6 lbs. of
beef, veal, pork, lamb, and mutton

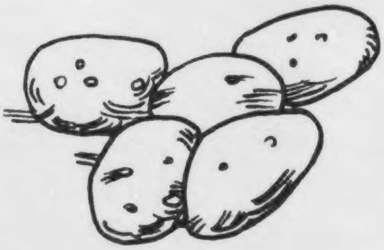
49 lbs. of chicken and turkey

348 lbs. of dairy products

156 lbs. of vegetables,
not including dry beans and peas

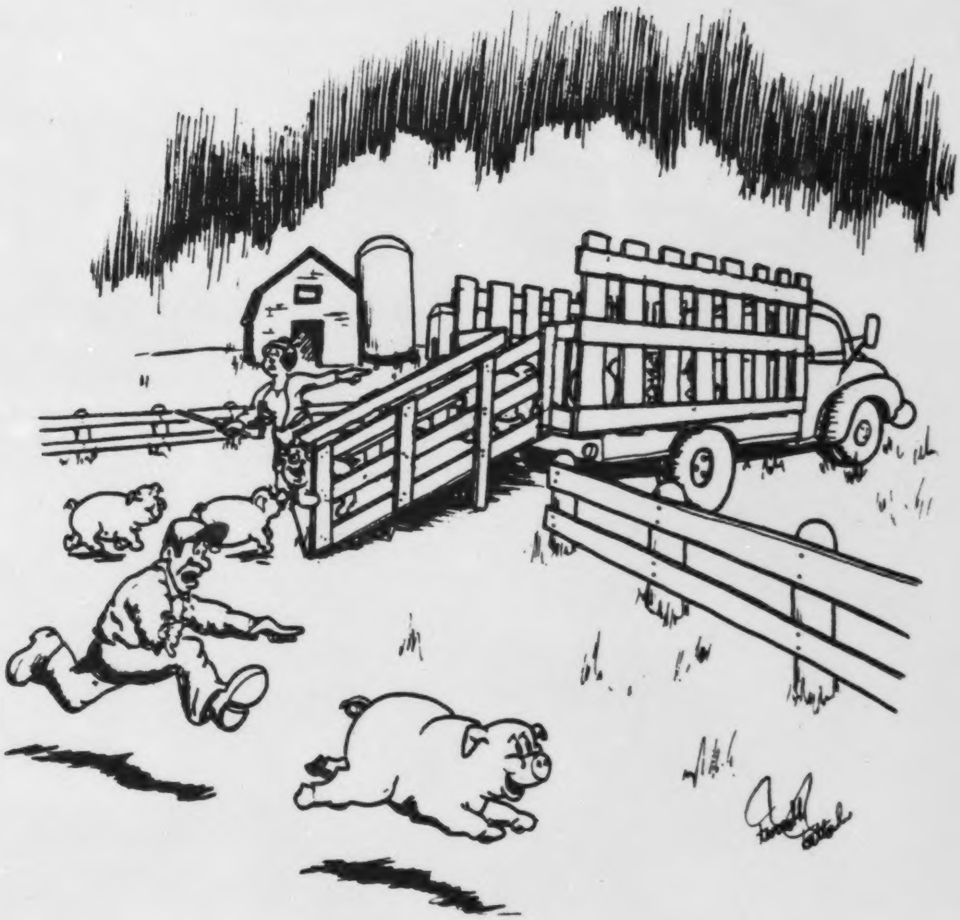


136 lbs. of
fruit and juice
(plus 17.5 lbs. of melons)



81 lbs. of potatoes

LETS GO TO MARKET



Eddy and Linda Johnsen are taking their animals to market. Eddy has pigs in his truck. Linda has steers in her truck. The animals are healthy. They have not had any medicine for a long time. As they pull into the parking lot of the stockyards, where they will sell their animals, they drive their trucks over a scale.

STEERS

For Linda's truck the scale reads	16,500 lbs
The truck and Linda together weigh	11,000 lbs
How much do the animals weigh?	_______ lbs
If there are five steers, what is their average weight?	_______ lbs

PIGS

For Eddy's truck the scale reads	19,420 lbs
The truck weighs	12,940 lbs
Eddy weighs	180 lbs
How much do the animals weigh?	_______ lbs
If there are 30 pigs, what is their average weight?	_______ lbs

LETS GO TO MARKET

SELLING. If Eddy and Linda Johnsen were selling their animals today in a city or a town close to you, about how much per pound would they get for their animals on the hoof? Your teacher will help you find that information. Then fill in the problems below and discover how much the Johnsens would get for each animal.

BEEF

Average market weight (see above) __________ lbs

Price per pound (on the hoof) $__________

Return to farmer per animal $__________

PORK

Average market weight (see above) __________ lbs

Price per pound (on the hoof) $__________

Return to farmer per animal $__________

PROFIT OR LOSS???

The Johnsens do not get to keep all of that money. They get to keep only what is left after expenses and taxes have been paid. Can you think of some of the expenses the Johnsens might have as they raise their animals?
Write some of their expenses on the line below.

______________________________ ______________________________

______________________________ ______________________________

______________________________ ______________________________

Markets

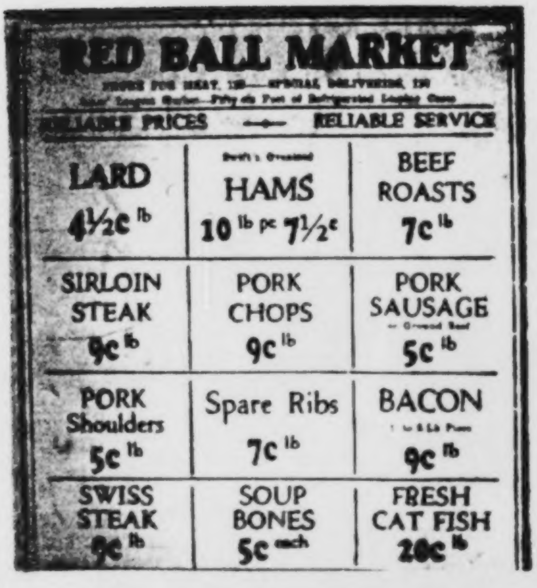
AMES DAILY TRIBUNE TIMES, AMES, IOWA
THURSDAY JANUARY 12, 1933

TODAY'S MARKET

PRICES BID BY LOCAL DEALERS

NEW EAR CORN	10¢	(BUSHEL)
CORN, SHELLED	11¢	(BUSHEL)
OATS	10¢	(BUSHEL)
HOGS	$2.55	(EACH)
CREAM, SWEET	21¢	(GALLON)
CREAM, SOUR	19½¢	(GALLON)
EGGS	21¢	(DOZEN)
HEAVY HENS	8¢	(EACH)
CATTLE	$5.25	(EACH)

(DELIVERED AT A CENTRAL MARKET)



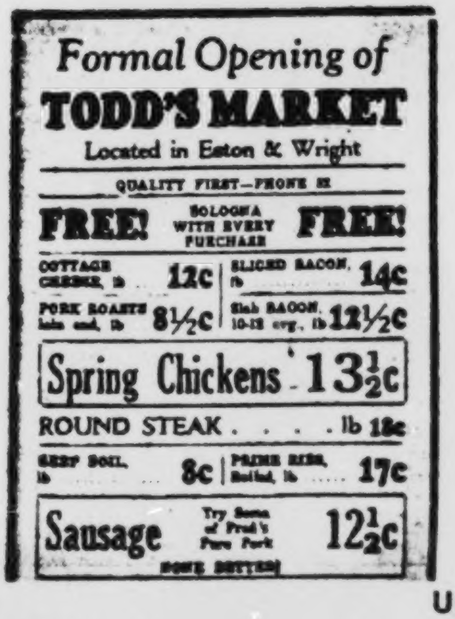
RED BALL MARKET

PHONE FOR MEAT, [illegible]—SPECIAL DELIVERING, [illegible]

[illegible]

RELIABLE PRICES —◆— RELIABLE SERVICE

LARD 4½c lb	[illegible] HAMS 10 lb pc 7½c	BEEF ROASTS 7c lb
SIRLOIN STEAK 9c lb	PORK CHOPS 9c lb	PORK SAUSAGE [illegible] 5c lb
PORK Shoulders 5c lb	Spare Ribs 7c lb	BACON [illegible] 9c lb
SWISS STEAK 9c lb	SOUP BONES 5c each	FRESH CAT FISH 20c lb



Formal Opening of

TODD'S MARKET

Located in Eston & Wright

QUALITY FIRST—PHONE [illegible]

FREE! BOLOGNA WITH EVERY PURCHASE **FREE!**

COTTAGE CHEESE, lb	12c	SLICED BACON, lb	14c
PORK ROASTS loin end, lb	8½c	Slab BACON, 10-12 avg., lb	12½c

Spring Chickens 13½c

ROUND STEAK . . . . lb 18c

BEEF BOIL, lb	8c	PRIME RIBS, Rolled, lb	17c

Sausage Try Some of Fred's Pure Pork **12½c**

NONE BETTER

BEST COPY AVAILABLE

FUN WITH FOOD
FACTS AND FANTASY

JOKING AROUND

* * *

Willy: How are an egg and a horse alike?
Nilly: Both must be broken before being used.

* * *

Willy: How do you make gold soup?
Nilly: Put in 14 carrots.

* * *

Willy: Why didn't the little boy eat his spinach after his mother told him it would put color in his cheeks?
Nilly: He didn't want green cheeks.

* * *

Eating Chickens

Forty years ago, Americans ate an average of only about 14 pounds of chicken a year. Things have really changed.

Would you believe it's now about 50 pounds? That's right. Americans eat an average of about 50 pounds of chicken a year. That's a lot of drumsticks!

"You're a Chicken!"

Why do some people say, "You're a chicken," when they mean you're afraid to do something? Why don't they say, "You're an elephant," or "You're a horse?"

Maybe the reason is chickens are small and can't defend themselves very well. So, to survive danger, they must run or fly away.

Quick Quiz You Can't Fail

Which is the better bargain?

A. 1 dozen eggs for 98 cents

B. ½ dozen eggs for 49 cents.

C. They both cost the same.

D. One chicken.

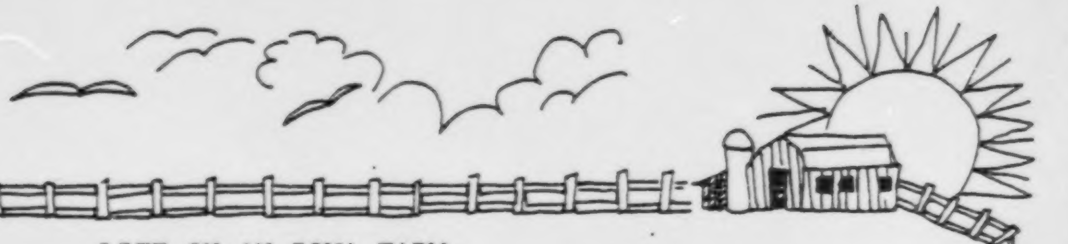
Would You Believe ...

... There are more chickens in the world today than there are people! And the number of chickens is growing faster than the human population. It's true!

A Real Egg Factory

Forty years ago, the average egg-laying hen laid 100 eggs a year.

She's more than doubled her egg-laying ability. Today, an average hen lays about 240 eggs a year. Let's hear it for the hen!



UNIT 3 LIFE ON AN IOWA FARM

Life on an Iowa farm can be fun, but it is also a lot of work. Every Iowa farm is different. Every farmer is an independent businessperson and runs his/her business differently than neighboring farmers. A typical Iowa farmer (statistically) would:

- be 49.7 years old
- farm 286 acres
- earn about $72,000 gross income annually
- earn about $14,000 net income annually
- have $679,927 invested in land, machinery, buildings, crops and livestock (national average - $261,297)

Most of the work done on a farm is done by family members. Often children will be given chores to do like gathering eggs, feeding calves and lambs, and helping clean out buildings. The amount of work done on the farm depends on the season with spring to fall being the busiest. The type and amount of work done depends on the type of farming operation (crop, livestock, or a combination of both). Most Iowa farms are diversified and have a combination of enterprises--cattle, swine, corn, soybeans, etc.

Farm children are involved in many activities. Many children belong to local 4-H clubs and often are members of Future Farmers of America when they get older. Through the clubs and chapters, children work directly with agriculture. They have projects they are responsible for and often exhibit the project or its results at the local fair. Examples would be an exhibit of corn grain, a steer, pen of pigs, or competition in a horsemanship event.

Living on an Iowa farm involves the entire family working together. Working on the farm is hard, but also exciting and challenging.

SUGGESTED ACTIVITIES

1. Obtain a copy of "People on the Farm." "People on the Farm" is an excellent resource series published by the U.S. Department of Agriculture, Office of Governmental and Public Affairs, (Address in the reference section). The series includes: Dairying, Broiler Growers, Corn and Hog Farming, Raising Beef Cattle, Orange Growers, Black Families, and Vegetable Farmers. There is also

a teacher's guide written for the series. A booklet entitled "Visiting People on a Dairy Farm" is written for lower age level students and would be excellent for 4th, 5th, and 6th graders. It takes a tour through a dairy farm and a look at the people that live there. There are also filmstrips that go along with the booklets.

2. Visit an Iowa farm. If not possible, have a resource person come in and explain what life on a farm is like.

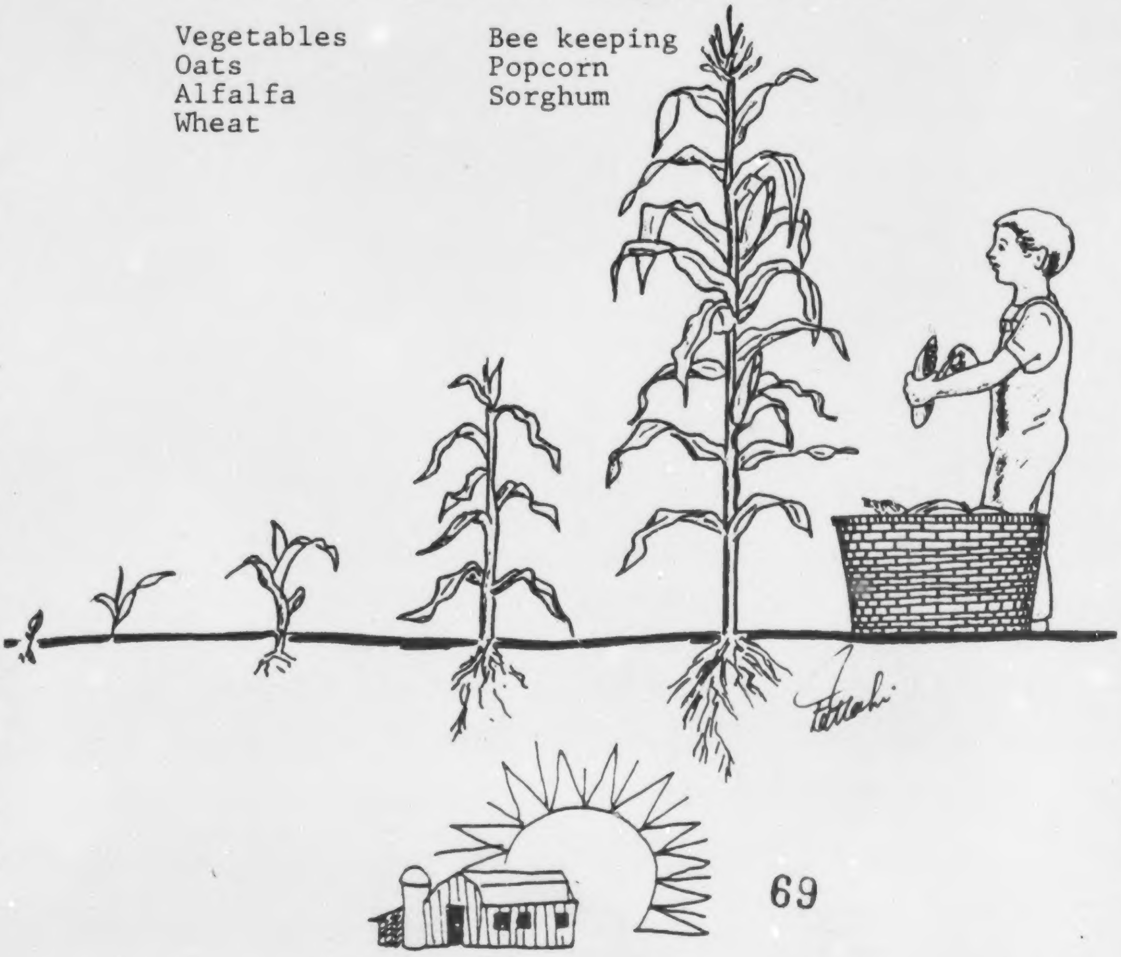
3. If you have students in your class from a farm, have them explain to the class what farm life is like. Discuss what they do in the form of chores and their responsibilities.

4. Using the INFO sheets, discuss how animals, crops, and eggs are produced. Discuss how production might change according to different farmers in different locations.

5. Using the ACT sheets have the students review what they learned about animals and crops.

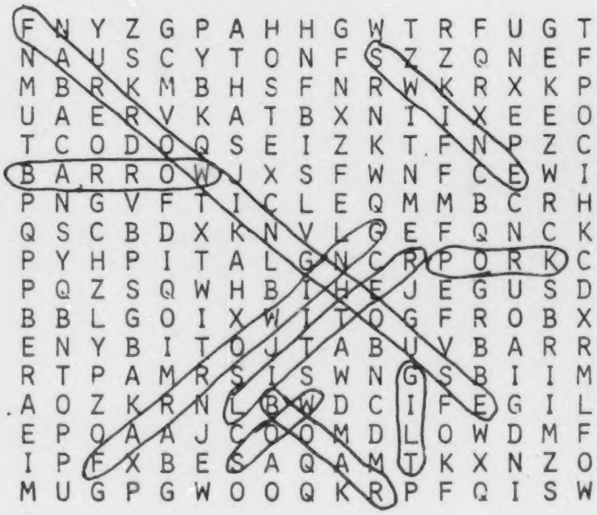
6. Have the students write reports on how different crops and livestock are produced. Examples might be:

   Vegetables
   Oats
   Alfalfa
   Wheat
   Bee keeping
   Popcorn
   Sorghum



KEY TO WORKSHEETS

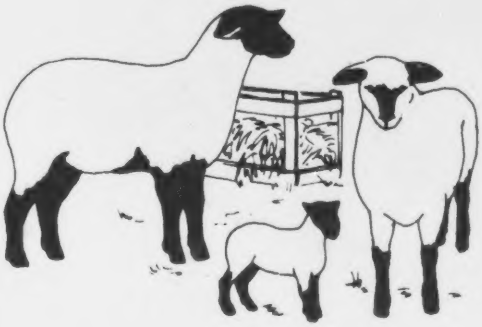
SWINE PRODUCTION



F	N	Y	Z	G	P	A	H	H	G	W	T	R	F	U	G	T
N	A	U	S	C	Y	T	O	N	F	S	Z	Z	Q	N	E	F
M	B	R	K	M	B	H	S	F	N	R	W	K	R	X	K	P
U	A	E	R	V	K	A	T	B	X	N	I	I	X	E	E	O
T	C	O	D	O	Q	S	E	I	Z	K	T	F	N	P	Z	C
B	A	R	R	O	W	J	X	S	F	W	N	F	C	E	W	I
P	N	G	V	F	T	I	C	L	E	Q	M	M	B	C	R	H
Q	S	C	B	D	X	K	N	V	L	G	E	F	Q	N	C	K
P	Y	H	P	I	T	A	L	G	N	C	R	P	O	R	K	C
P	Q	Z	S	Q	W	H	B	I	H	E	J	E	G	U	S	D
B	B	L	G	O	I	X	W	I	T	O	G	F	R	O	B	X
E	N	Y	B	I	T	O	J	T	A	B	U	V	B	A	R	R
R	T	P	A	M	R	S	I	S	W	N	G	S	B	I	I	M
A	O	Z	K	R	N	L	B	W	D	C	I	F	E	G	I	L
E	P	O	A	A	J	C	O	O	M	D	L	O	W	D	M	F
I	P	F	X	B	E	S	A	Q	A	M	T	K	X	N	Z	O
M	U	G	P	G	W	O	O	Q	K	R	P	F	Q	I	S	W

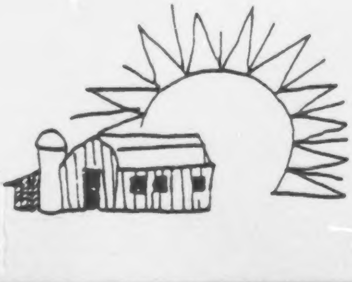
POULTRY AND EGG PRODUCTION
KEY

ickcsh	- chicks
ustplo	- poults
wsrgreo	- growers
oncttarc	- contract
zrdaigz	- gizzard
rolirebs	- broilers
ralye	- layer



A PIG GROWS UP --- KEY

Question 1 - Circle the pig that weighs 220 pounds.
Question 2 - Circle the ground corn and protein and mineral supplements.
Question 3 - A pig must eat 15½ bushels of feed to reach market weight.
Question 4 - The amount of supplement meeded is 120 pounds.
Question 5 - It takes the pig 6 months to reach market weight.



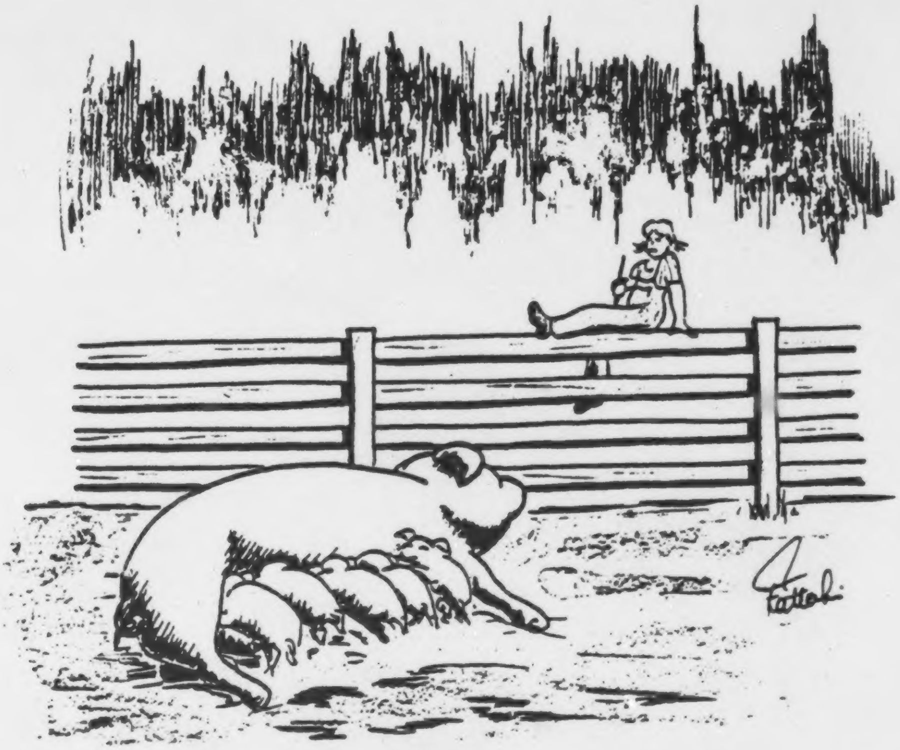
Raising Swine

Two litters of pigs are born each year on the farm. A litter averages seven to eight pigs but 10 to 12 or more is common. The mother is called a sow and she might weigh 300 pounds. The father is called a boar and may weigh 400 pounds.

Many farmers have special buildings for the birth of baby pigs or farrowing. This building is called a farrowing house. The farrowing house allows the sow and her litter to stay comfortable. The sow farrows in a long narrow stall called a farrowing crate. This prevents the sow from accidently lying on her pigs but does allow the sow free movement. The farmer must carefully watch the sow and baby pigs to prevent disease. Baby pigs are given shots to help them stay healthy.

When the pigs are one month old they are weaned from their mother. The baby pigs rapidly gain weight. By the time they are one and one half month old they weigh about 40 pounds. The pigs eat a high protein feed and are allowed to run in a large lot or pasture.

The males are castrated and are called barrows. Some of the fastest growing males are not castrated and are kept for breeding. The young female pigs are called gilts. The farmer will keep the best gilts to use for breeding. The gilts and barrows eat ground corn and soybean meal for about 4 months or until they reach 210 pounds. Then the farmer will sell them.



Swine Production

F	N	Y	Z	G	P	A	H	H	G	W	T	R	F	U	G	T
N	A	U	S	C	Y	T	O	N	F	S	Z	Z	Q	N	E	F
M	B	R	K	M	B	H	S	F	N	R	W	K	R	X	K	P
U	A	E	R	V	K	A	T	B	X	N	I	I	X	E	E	O
T	C	O	D	O	Q	S	E	I	Z	K	T	F	N	P	Z	C
B	A	R	R	O	W	J	X	S	F	W	N	F	C	E	W	I
P	N	G	V	F	T	I	C	L	E	Q	M	M	B	C	R	H
Q	S	C	B	D	X	K	N	V	L	G	E	F	Q	N	C	K
P	Y	H	P	I	T	A	L	G	N	C	R	P	O	R	K	C
P	Q	Z	S	Q	W	H	B	I	H	E	J	E	G	U	S	D
B	B	L	G	O	I	X	W	I	T	O	G	F	R	O	B	X
E	N	Y	B	I	T	O	J	T	A	B	U	V	B	A	R	R
R	T	P	A	M	R	S	I	S	W	N	G	S	B	I	I	M
A	O	Z	K	R	N	L	B	W	D	C	I	F	E	G	I	L
E	P	O	A	A	J	C	O	O	M	D	L	O	W	D	M	F
I	P	F	X	B	E	S	A	Q	A	M	T	K	X	N	Z	O
M	U	G	P	G	W	O	O	Q	K	R	P	F	Q	I	S	W

Find these nine words (other words are also in the puzzle). The words are horizontal, vertical, and diagonal.

Can you define them?

barrow____

farrowing____

gilt____

pork____

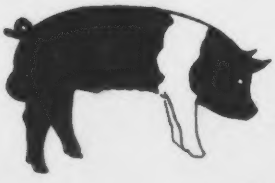
swine____

farrowing house____

litter____

sow____

boar____



Unit 3
ACT

A PIG GROWS UP

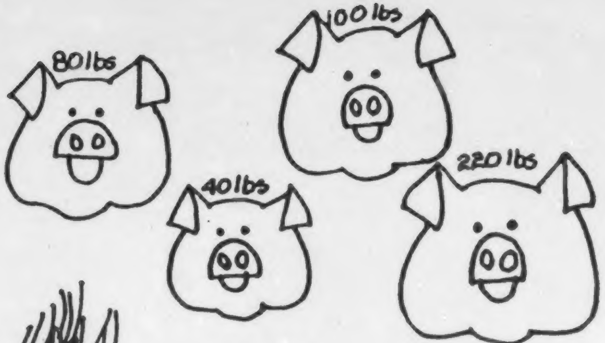
A pig is weaned (begins to eat other than from its mother) at approximately 4-7 weeks. After it is weaned, it is called a feeder pig.

A pig eats ground corn, protein and mineral supplements. A farmer must be sure the pigs have water available at all times.

To reach a market weight of 220 pounds takes about 6 months.

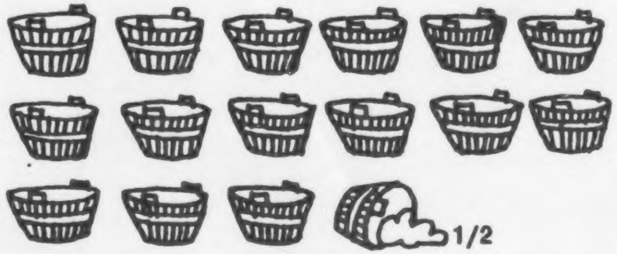
DIRECTIONS:

Find and draw a circle around the pig that is just the right weight for market.



Circle the items the pig must have in its diet to make it the right market weight.

To reach market weight the pig must eat how many bushels of feed? COUNT THEM. ________________



This equals approximately 870 pounds of feed—750 pounds of corn and how many pounds of protein and mineral supplements?________________ (Subtract the two figures to find that answer).

To reach a market weight of 220 pounds takes about how many months?________________(Find the answer on this page.)

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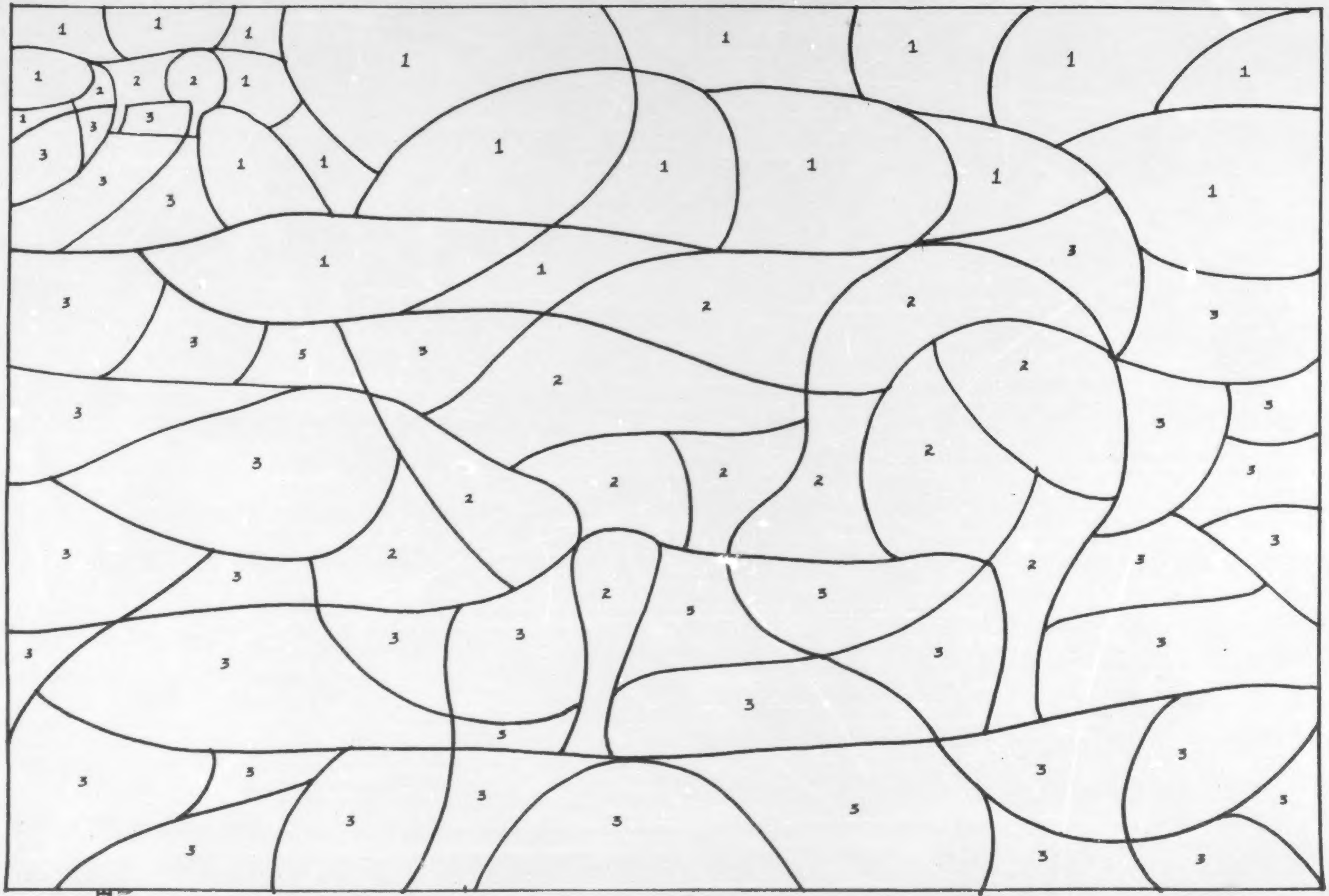
CAN YOU FIND THE PIGS?

If you color each space the right color, you will find two pigs.

1 = BLUE 2 = PINK 3 = GREEN



Unit 3

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Corn Production

Before corn can be planted in the spring, the farmer has work that must be done. The farmer studies the amount of fertilizer needed and orders the proper amount to receive the highest profit and yield. Fertilizer requirements are determined by a sample of soil sent in to a soil testing laboratory. The fertilizer is applied when the field is being prepared for planting. Several different methods are used to prepare the soil for planting. Methods which stir up just enough soil for the seed, but still leave crop residue on top to help prevent erosion are becoming more popular.

The corn yield reports from the seed companies are carefully studied. The type or variety of seed that will best fit the farmer's needs are selected and purchased. Types of herbicides (to kill weeds) and insecticides (to kill harmful insects) are selected. The variety of seed, type and amount of fertilizer, herbicide, and insecticide will be determined by the cost of the product and the profit the farmer expects from the crop.

The first step in planting in the spring is preparing the seedbed. A seedbed is the first few inches of soil where the seed will be placed. It is very important to have a seedbed without large pieces of soil or rocks so the plant will be able to grow quickly.

The corn is planted in May using a corn planter. The corn planter drops the kernels of seed into rows and then presses the soil around each kernel. The herbicide and insecticide are also applied at this time. The farmer waits until the corn gets a few inches high and may cultivate, if needed. The cultivator cuts and uproots the weeds that might be growing between the corn rows. It is similar to hoeing a garden, except a cultivator will do many rows at one time. The farmer must be very careful to drive between the corn rows to prevent the cultivator from destroying corn plants. The rest is up to the weather. Weather is extremely important to the growing corn plant. Just one week of extreme heat and dryness can reduce yields.

The farmer harvests the corn in early October. The majority of the corn in Iowa is called dent corn because the top of the kernels dent inward when the corn is mature and starts to dry. This corn is used mainly for animal feed and is different from the sweet corn you purchase in the grocery store. Harvesting is done by large combines. A combine is a large machine that will cut off the corn plant, remove the ear of corn, and separate the kernels from the corn cob. The farmer then dries the corn using large drying bins. Drying will help prevent spoilage in storage and the farmer will receive a higher price at the market. The farmer has several options for his grain. It can be sold, stored, or fed to livestock. The most profitable alternatives varies from year to year.

Raising Beef Cattle

Larry decided to run out to the pasture to check on the calves. He learned yesterday a calf is what cattle are called that are under one year of age. A calf's mother is called a cow. A cow is pregnant for nine months before giving birth to a calf. A calf can weigh 70 pounds at birth and will nurse on mother's milk until it is about four months old. The farmer has to check often on the cow and calf to make sure they stay healthy and are well fed. The farmer also gives the calves a series of vaccinations to prevent disease. The calf is branded and castrated if male. Male cattle that are castrated are called steers. The young female cattle are called heifers and the male cattle that are used for breeding are called bulls.

When the calf is five months old it is weaned from its mother. By this time, the calf can eat grass and drink water. Cattle have a four part stomach, unlike our one part stomach, that allows them to eat roughages like grass and hay and convert them to protein. Cattle can graze on land unfit to grow crops for human consumption and convert the grass into high quality protein.

After weaning the calves are placed into feedlots where they will eat corn, silage (the whole corn plant finely chopped) and hay. The farmer also feeds them minerals and supplements.

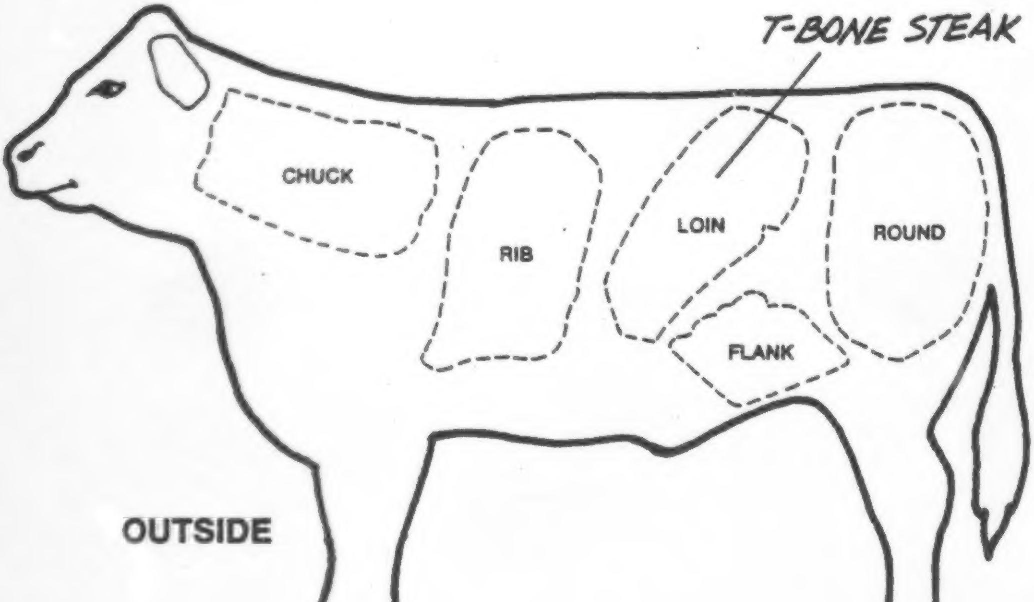
At night the cattle sleep in sheds. The sheds are long buildings with open fronts to allow air to circulate. The buildings keep the cattle warm in the winter and provide shade in the summer. The cattle will stay on the farm for about 10-12 months or until they weigh about 1100 pounds. The farmer will then sell the steers and heifers to a nearby market.

INTRODUCING...
THE CATTLE KING

BEEF CATTLE are among the most important farm animals. Each American eats an average of 125 pounds per year of roast beef, veal, hamburger, hot dogs, and other beef products. American farmers sell more beef than any other product. So, beef cattle are truly the "Kings" of the American farm.

WHO NEEDS A KING? We ALL need the Cattle King. Why do you think that we need him? (How many of your class said "for hamburgers?") Here is another important reason. About 83% of our land can't be used to grow crops for humans to eat. But grass that feeds cattle grows on almost ½ of that land. Without King Cattle, a great deal of our land could not be used to grow food.

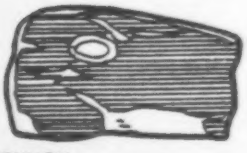
DIRECTIONS: At the bottom of the page, you will find some of the favorite "cuts" or kinds of meat that are obtained from cattle. Cut out each one and place it over the proper place on the outside of the beef animal where it could be found. Then re-label each cut to help you remember it. T-Bone steak has been labeled for you.



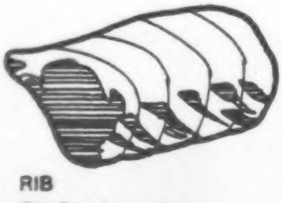
INSIDE

Major cuts from the forequarter (or front) are chuck and rib.

Hindquarter cuts are loin and round.

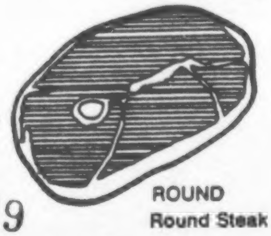


CHUCK
Arm Pot-Roast
or Steak Rib

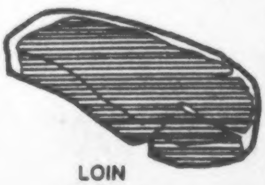


RIB
Rib Roast
Small End

FLANK
Hamburger



ROUND
Round Steak



LOIN
T-Bone
Steak

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Milking Dairy Cows

"Wake up!"

"But, Mom, it's four o'clock in the morning!"

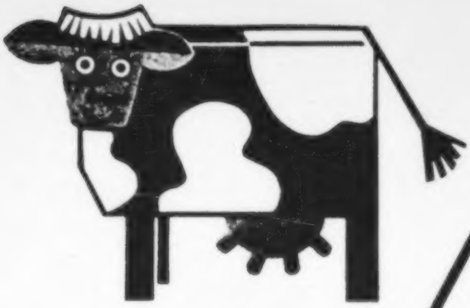
If you lived on a dairy farm, your mother might get you up very early in the morning to help with milking. Some farmers start milking as early as 2:30 in the morning. Why so early? Cows have to be milked every 12 hours. If they are milked early in the morning, they can be milked early in the afternoon and allow the farmer to have the night free to do something else. Every dairy farmer has his/her own way of milking cows. Let's take a look at how one farmer does it.

First, the cows are brought up from the pasture. The farmer has to check carefully to make sure all the cows are up to the barn and that none are sick. As the farmer opens the barn doors, the cows slowly walk in. Each cow will walk into her own stall where she will find her morning breakfast of corn silage. The farmer starts on one end of the "milking parlor." The cows' udders are carefully washed off. A dairy farmer has to be especially careful everything is clean. In order for the farmer to sell grade A milk (the kind you buy at the supermarket), the milking parlor must meet standards set up by the Department of Agriculture and be kept very clean.

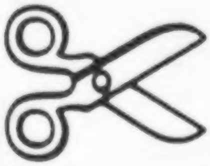
After the udders are washed, a milking machine is placed on the cow. The milking machine allows the farmer to milk more cows than in the past when all cows had to be milked by hand. The milk passes through a pipeline into a cooling tank where it is chilled to 38°F. The milk is held in the tank until the milk truck comes to pick up the milk later in the morning.

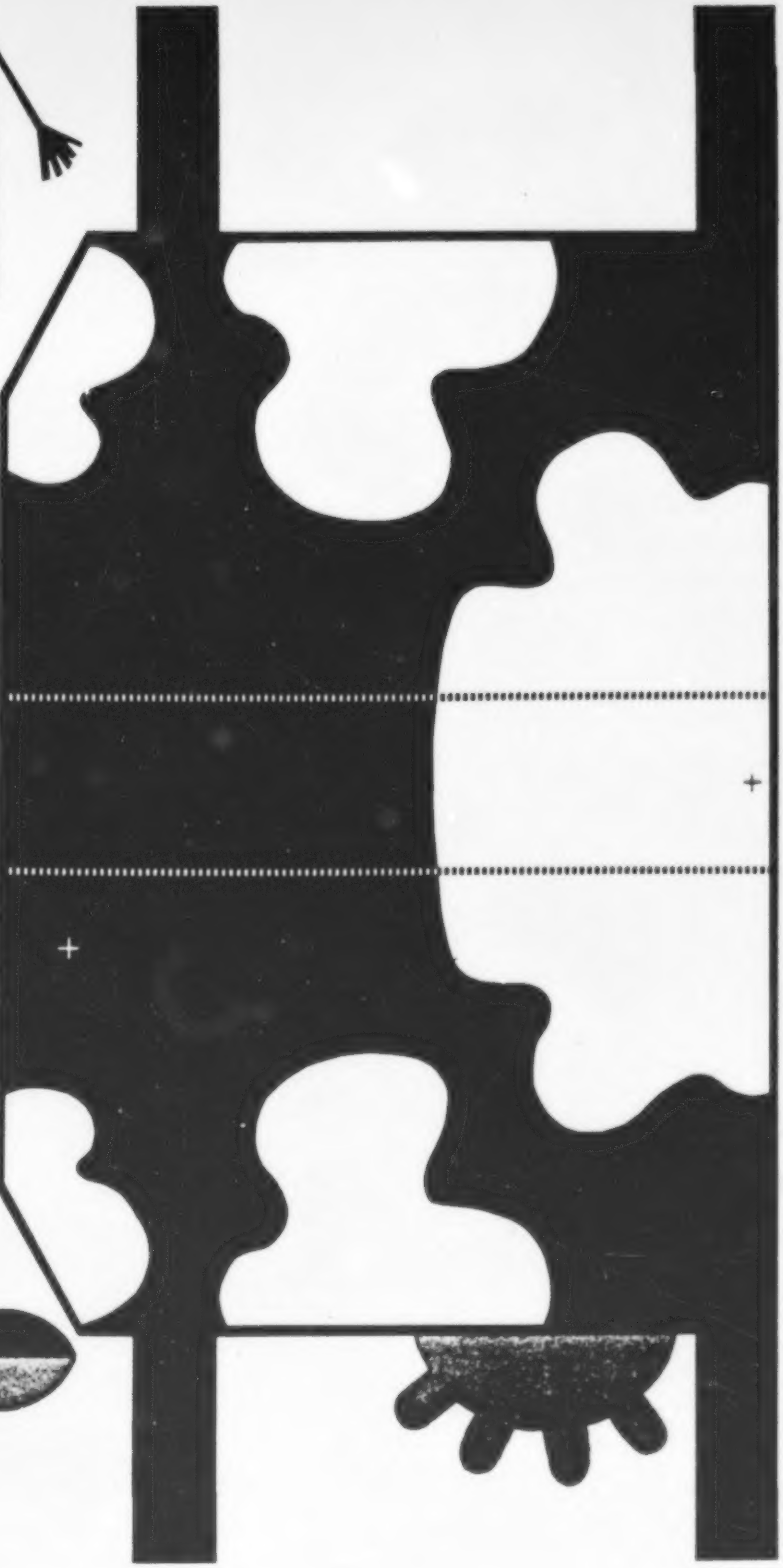
When the cows are finished milking, they are let outside. An average dairy cow will give about 11,200 pounds (1302 gallons) of milk a year. She milks for about 305 days (10 months) following the birth of her calf. Then the cow "dries up" (stops milking) for 2 months before she gives birth again.

The chores are not over when the cows are finished milking. All the equipment has to be washed and the milking parlor has to be washed down. The calves need to be fed along with the bulls and heifers. The heifers will someday replace the cows currently being milked. Careful records must be kept to find out what animals are the best producers. Milking 80 cows takes two hours and after you have finished cleaning up, you might be able to just make a seven o'clock breakfast. Milking is finished--that is, until 4:00 in the afternoon.



Cut Out Your Own Cow



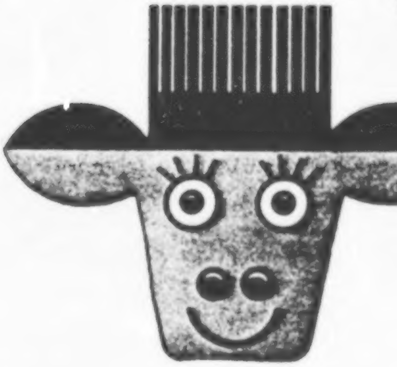


FOLD ALONG THE DOTTED LINES

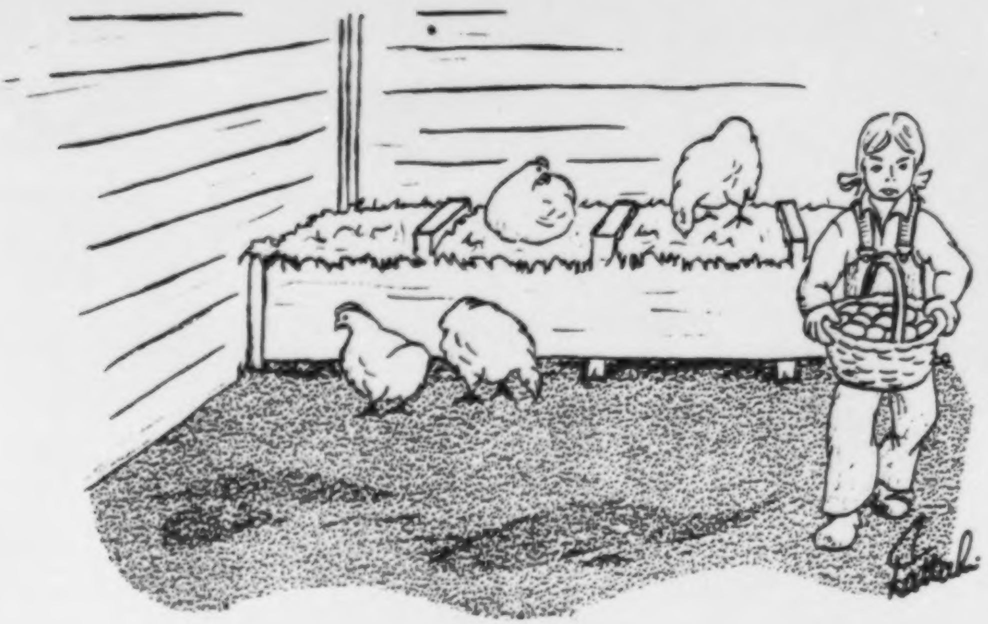
ATTACH HEAD HERE

ATTACH TAIL HERE

CUT OUT AND CURL HAIR AROUND PENCIL



Egg Production



Egg production has changed drastically since your grandparents kept a few hens on the farm for their own egg supply. Today, most egg production takes place on large poultry farms with several thousand hens kept in very modern environmentally controlled buildings.

Special female chickens are raised specifically to produce eggs - they are called layers. They are developed to produce a large quantity of eggs. The chickens that are raised specifically for cooking are called broilers. The layers will start producing eggs when they are about six months old. The eggs are laid in sequences. The layer will lay one egg per day for four to seven days, skip a day, and then repeat the sequence. They will lay for about fifty weeks and produce about 230-250 eggs during the first year.

A large majority of eggs are produced for human consumption. Some, however, are kept for hatching. If an egg is kept warm and carefully turned several times a day, a baby chicken (or chick) will hatch in 21 days. The male chicken is called a cockerel until one year of age. Then it is called a rooster. A young female is called a pullet until about one year old, and then she is called a hen.

It is very important that a fresh supply of water is made available to the chickens. The layer's diet consists of cornmeal and soybean meal. A chicken does not have teeth so their food is ground up in a special stomach called a gizzard. This stomach is different from ours and is specially designed for grinding up and digesting food.

The farmer must collect the eggs at least once a day. The eggs are washed and packed in special boxes and picked up by a special refrigerated truck.

Poultry Production

Some Iowa farmers keep a few chickens and turkeys on the farm for personal consumption, but the majority of turkeys and chickens produced in Iowa are by large specialized farmers. One farmer might raise 10,000 chickens or turkeys at one time.

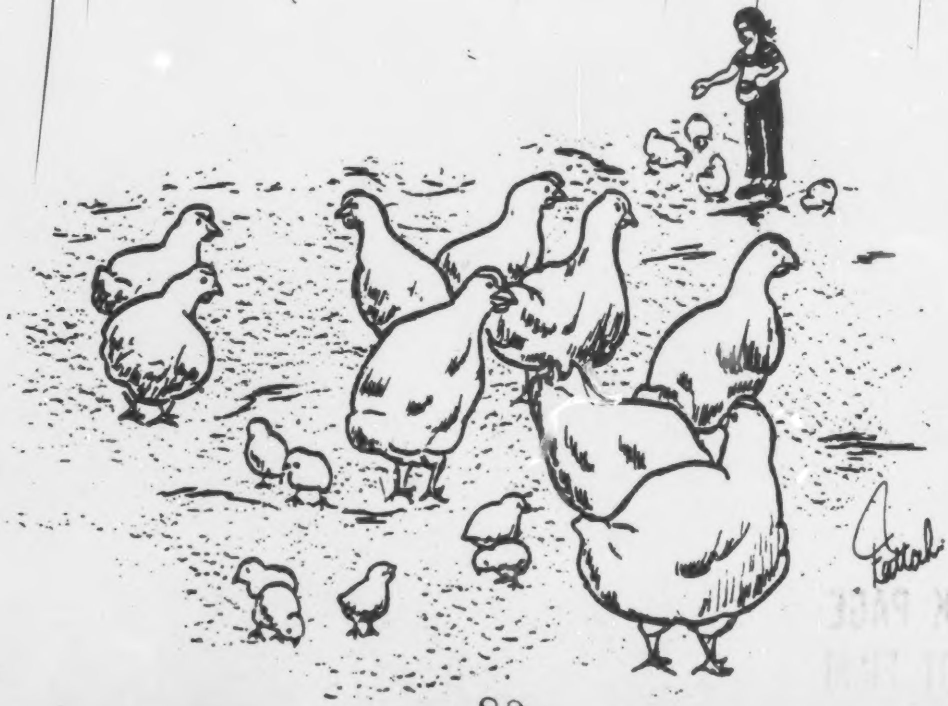
Much of the large producers raise chickens and turkeys by contracting. The farmer sets up a contract with a large poultry company to grow the chickens or turkeys. The farmer supplies the labor, buildings, and equipment and the company owns the birds and provides the feed. The farmer gets paid for each pound of bird produced. The amount paid per bird is small so the farmer must produce large numbers of birds in order to make a living.

When the birds first arrive on the farm they are a few days old and the temperature is kept at about 95°F. As the birds get old the temperature is lowered gradually for about two weeks until it reaches 75°F. The birds frighten easily so the farmer has to be careful when working around them so not to scare them

The young chickens under eight weeks old are called chicks while the young turkeys are called poults. The chickens are called growers when they are between eight and twenty weeks old while the turkeys are called turkey growers.

The chickens or turkeys are raised in long buildings--sometimes they are long as a football field. The farmer is very careful to keep the birds as comfortable as possible. The side panels of the building can be raised or lowered to regulate ventilation.

The birds are fed a specialized ration. Due to improved rations, better disease control, and improved varieties, chickens that once took six months to get to market now only take two months.



Poultry and Egg production

THE FOLLOWING WORDS ARE MIXED-UP. WRITE THE CORRECT ANSWER IN THE SPACE PROVIDED.

ickcsh	________________	Young chickens under eight weeks old.
ustplo	________________	Young turkeys under eight weeks old.
wsrgreo	________________	Young chickens between eight and twenty weeks old.
oncttarc	________________	Most turkeys and chickens are raised by _______ between the farmer and the poultry company.
zrdaigz	________________	A special kind of stomach found in chickens and turkeys.
rolirebs	________________	Chickens raised specifically for cooking.
ralye	________________	Female chickens raised specifically to produce eggs.

Soybean Production

The soybean plant is in the legume family. Legumes, with the help of a specific bacteria, are able to take nitrogen (an important plant nutrient) from the air, fix it to the roots in small nodules, and make it available for use by the plant. After a soybean crop is harvested, there is enough nitrogen left in the soil to help meet some of the fertilizer needs the following year for a crop that can not fix its own nitrogen like corn. Rotating crops like corn and soybeans allows farmers to save money and make the best use of the nutrients in the soil.

Before planting the soybeans, the farmer selects and buys seed, fertilizer, and pesticides. The soybeans are planted in middle to late May--usually right after the corn is planted.

The soybeans are cultivated when they are about six inches tall. Cultivating will kill most of the weeds between the rows. Weeds and volunteer corn (corn that has grown from seeds that were left after harvesting the previous year) can not be completely controlled by chemicals because the soybean is very sensitive to many chemicals. The corn and weeds that remain in the field after cultivation are often removed by walking through the fields and pulling them by hand. "Walking beans" is a popular way for children to earn extra money during the summer. It is very important to the farmer also, because if corn kernels and weed seeds are harvested with the soybean crop the farmer will receive a lower price when the soybeans are sold.

The soybean crop is harvested in September or October. An Iowa soybean field yields an average of 40 to 50 bushels per acre depending on the year. Farmers have increased their yields in the past few years by using no-till and by planting the soybeans in narrow rows.

Sheep Production

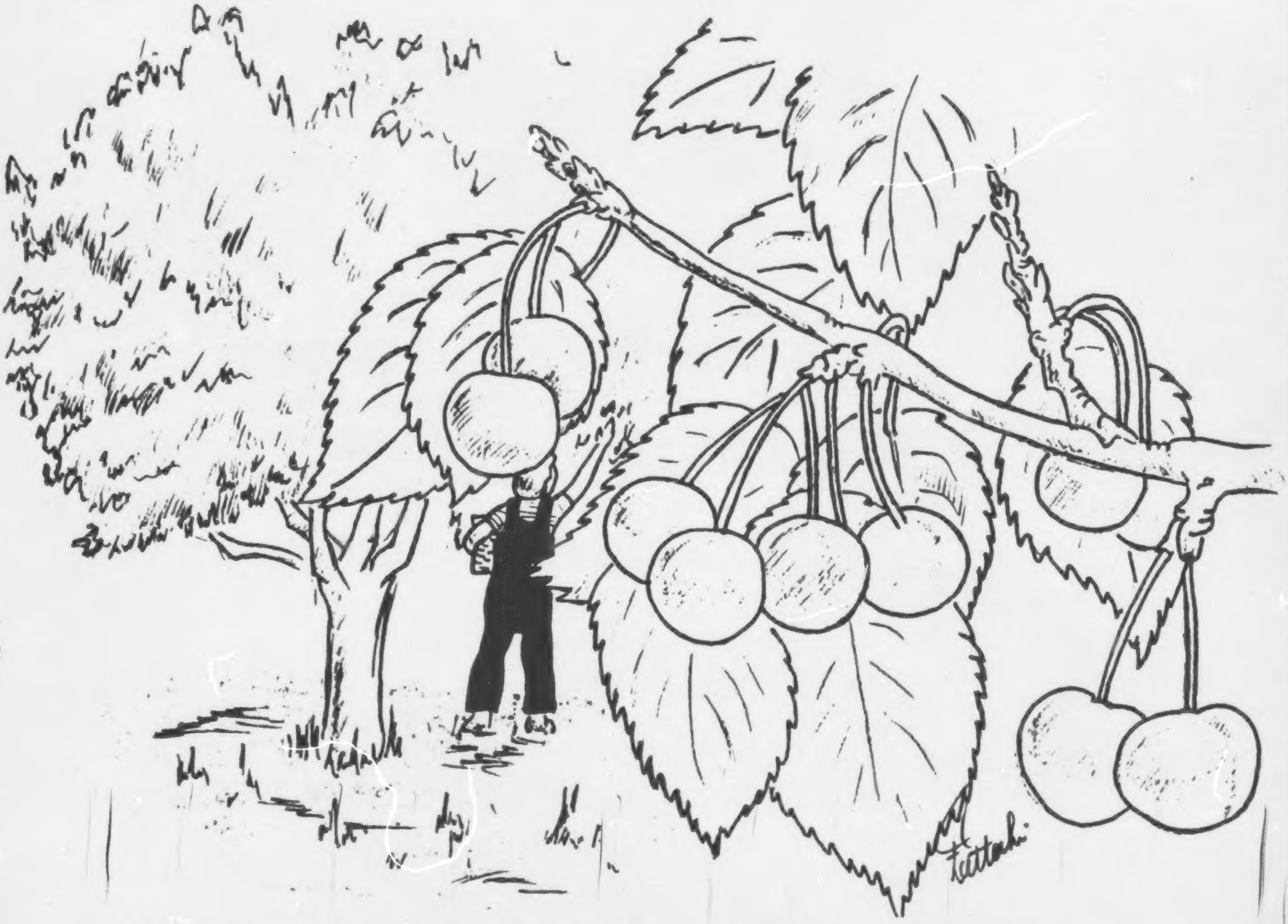
Although Iowa is not the largest sheep producer in the United States, it does have the largest number of flocks. This is because an average Iowa flock has 25-50 sheep while flocks in western states, like Wyoming or Texas, may have several thousand sheep.

Adult female sheep are called ewes. An ewe will give birth to lambs about five months after being mated to a ram (an adult male sheep). The ewe may give birth to one to three lambs at one time. The farmer likes to see the ewe have two lambs because the ewe is usually able to best care for twins. The farmer makes the ewe as comfortable as possible during lambing--providing her with an area that is clean, dry, well bedded, and well ventilated yet free from drafts. Sometimes, the farmer will have to bottle-feed a lamb that is weak or an orphan.

The ewes and their lambs graze on pasture grass until the lambs reach about 110 pounds, usually seven months of age. Then they are ready for market. Sometimes, the lambs are weaned at two or three months of age and fed grain, while the ewes return to pasture. Ewe lambs (young females) and wethers (young castrated males) reach market weight much quicker when they are fed grain.

Sheep produce not only meat but also wool. Sheep are shorn once a year in the Spring by skilled shearers. The wool is sold on a per pound basis to large companies where it is manufactured into yarn, clothing, rugs, etc. The sheep stay cooler in the summer without their heavy coat of wool.

Orchards



All areas of Iowa produce some type of fruit. The type of fruit grown in the area depends on the climate, soil, and variety of fruit. Some of the more common fruits grown in Iowa are apples, strawberries, raspberries, plums, currants, gooseberries, and sour cherries.

Apple trees are commonly grown in Iowa. After a tree is planted it takes three to six years before the tree starts bearing fruit depending on the variety of apple. Apple orchards can be as small as two trees or cover several hundred acres. Apple trees need plenty of room to grow. For example, only 180 Red Delicious trees can be planted on one acre. The trees must be sprayed ten to twelve times during the year to prevent insect damage. During the winter, the farmer must wrap the trunk of the tree to prevent damage by rabbits and field mice.

Apple production is not new to Iowa. Julien Dubuque planted the first apple trees in Iowa soon after his arrival in Dubuque County in 1795. Apples enabled early settlers to include fruit in their diets.

FUN WITH OUR FARM ANIMAL FRIENDS

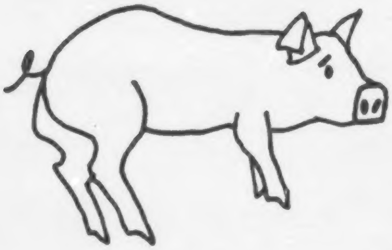
Use the following code to find the riddle answers.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
9	1	8	17	4	14	12	23	5	16	6	15	11	21	24	3	18	7	10	20	25	2	19	26	13	22

WHAT DID THE PIG SAY WHEN A FARMER GOT HIM BY THE TAIL?

20 23 5 10   5 10   20 23 4

4 21 17   24 14   11 4



WHAT IS A BABY PIG AFTER HE IS FOUR DAYS OLD?

14 5 2 4

17 9 13 10   24 15 17

WHY DOES A COW GO OVER A HILL?

10 23 4   8 9 21 20   12 24

25 21 17 4 7   9   23 5 15 15

WHAT TIME IS IT WHEN A COW SITS ON A FENCE?

20 5 11 4   20 24

12 4 20   9   21 4 19   14 4 21 8 4

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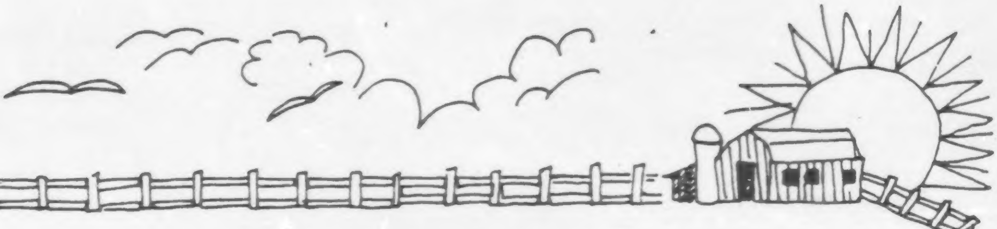


Unit 4
Chapter 1

AGRICULTURE AND YOU

From Stewpots to Supermarkets

Two centuries ago, typical American families ate out of stewpots. Most of what went into the pots was supplied by farming, fishing, hunting and foraging in the wild. On special occasions such as holidays or weddings, people pooled their food and labor to provide greater variety and had a feast.

Today, every day is feast day for American food shoppers. On display in the average supermarket, they may find more than 5,000 different products. Much of the work of preparing these foods, including the cooking, is often done before it reaches the checkout counter.

Modern ranching and farming, combined with progressive systems of processing, distributing and merchandising provide abundant, wholesome food when, where and how we want it. This agricultural progress is the result of research, hard work and the ingenuity of ranchers and farmers. Research provides better techniques for management of the soil and water, improves quality of animals and plants and develops better methods for transporting, storing, marketing and merchandising of farm products. Educational services quickly transmit newly acquired knowledge to farmers and the agricultural trades.

Agriculture Creates Jobs

Agriculture is the nation's biggest industry. Its assets are equal to about three-fourths of the capital assets of all manufacturing corporations in the U.S. Agriculture is also the nation's largest employer requiring the services of 8 to 10 million people to transport, store, process and merchandise the output of agricultural products from farms. Farming itself uses 4.4 million workers--as many as the combined payrolls of the automobile industry, the steel industry and transportation industry. Between 14 and 17 million people work in some phase of agriculture--from growing fiber and food to selling it at the supermarket. Here are a few examples of where these people work:

--Meat and poultry industry, including meatpacking, prepared meats and poultry dressing plants.

--Dairy industry, including manufacturers of such products as cheese, butter, fluid milk, concentrated and dried milk and ice cream.

- --Baking industry, including plants for making bread, biscuits and crackers.
- --Canned, cured and frozen food plants.
- --Cotton mills and finishing plants.
- --Another 3 million people provide seeds, fertilizers and other supplies farmers use for production and family living.

Agriculture Gets Food From The Farm To Your Table

American farmers are linked to you by a complex food marketing system. Each year consumers spend more than $180 billion on U.S. farm produced foods. About $124 billion of those dollars is spent to get food from the farm to your table. More than 400 million tons of this food were inspected, graded, processed assembled, packaged, stored, wholesaled and retailed. To reach you, the consumer, this food traveled, in many cases, 3.2 million miles of intercity highways, 201,000 miles of railroads and 26,000 miles of waterways.

Packaging and transportation cost approximately $28 billion each year. The food marketing system has developed a computerized checkout, inventory, and ordering system that helps to streamline food retailing and shopping.

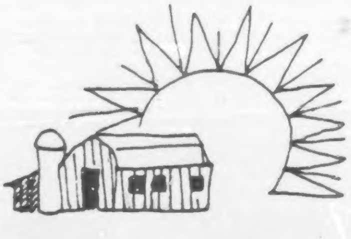
Because of the farmer's efficient output, we can enjoy a satisfying variety and quantity of food. Farmers produce not only enough for us, but enough to make large quantities of farm products available for international trade. Production from 1 acre out of every 3 goes overseas. We export more farm products than anyone else in the world.

Farmers are Consumers

Like everyone else, the American farmer is a consumer and taxpayer, as well as a producer. Farm operators spend about $86 billion annually for goods and services to produce livestock and crops. Both their farm and nonfarm incomes are spent for personal taxes, investments, and for the same things that city people buy.

Farmers' annual purchases include:

- --$10.9 billion for farm tractors and other motor vehicles, equipment and machinery.
- --$17.4 billion for feed and seed.
- --$6.9 billion for lime and fertilizer.
- --Products containing 360 million pounds of rubber--about 5 percent of the total in the U.S., or enough to put tires on nearly 7 million automobiles.
- --33 billion kilowatt-hours of electricity--about 2 percent of the Nation's total.



You Get More Food for Your Money

Family income buys considerably more food today than it did 27 years ago, partly because incomes have risen faster than food prices and partly because agriculture has become much more efficient.

Diets have become more varied. We eat 20 percent more poultry, 24 percent more beef per person, more vegetables and more fruits than we did 10 years ago. We also eat out more often which boosts food sales by 134 percent.

The nation also provides family food assistance programs for more than 16 million people. Approximately 2.5 million children receive nutritious breakfasts at school under the School Breakfast program and approximately 26 million children participate in the National School Lunch Program.

SUGGESTED ACTIVITIES:

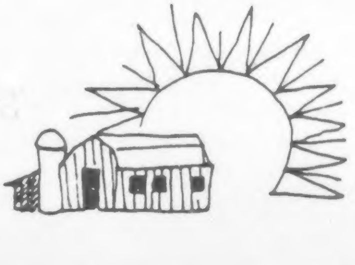
1. Using INFO-1, ask students to read about "Pioneer Meals in Iowa." Contrast meals then with those of today. Discuss the foods eaten and the preparation methods.

2. Invite an elderly member of your community to discuss food preparation methods used when they were a child. Some examples are:
    - canning of vegetables and meats
    - smoking and salting of meats and fish
    - churning butter
    - baking bread
    - grinding grain into flour

   Then have them discuss how foods were stored. Ask them what staples (salt, sugar, pepper, etc.) had to be purchased and what was their method for purchasing these items.

3. Students may enjoy setting up a country store in a corner of the classroom. In another corner, you may wish to simulate the modern supermarket. Ask students to bring in empty boxes, cans, etc. to stock the shelves.

4. Using INFO-2, discuss today's breakfast. Ask students what they had for breakfast this morning. Where did all the items come from? What processing methods were involved in preparation of those foods? How did those items get to the supermarket?



5. Discuss how different foods are produced, processed, packaged and prepared.

6. Using INFO-3, discuss processing methods (pasteurization and homogenization) necessary to get milk to their table. Have students bring in milk containers. Have vitamins been added? What about the container itself--who made it?

7. Make a flow chart showing the route for milk and the different occupations that might be involved in getting the milk from the farm to your table. Some examples are:
   - -dairy farmer
   - -tank driver
   - -dairy plant manager
   - -dairy plant worker
   - -delivery driver
   - -supermarket manager

8. If possible, visit a local dairy operation to see what is involved in the production phase of milk. Make sure the visit includes the feeding facilities, milking parlor, housing facilities, calf facilities, bulk tank facilities, etc.

9. If a field trip is not possible, invite the dairy operator to your classroom. Arrangements can be made through your local Vocational Agriculture department, county agent, or Dairy Cooperative.

10. Discuss INFO-4 and the steps involved in getting grain from the farm to your table. How are other grain products used? Examples of grains to discuss are:
    - oats
    - rice
    - corn
    - sorghum (milo)
    - barley

11. Ask students to select and report on other products that they might find on their tables. Have them include production, processing, transportation, packaging and preparation for the particular food selected. This could also prove to be an excellent group activity.

12. Have students draw or make a collage of magazine pictures showing a typical meal. Help students identify the main ingredient of each food and the farm product from which it is made. Discuss where the farm product is raised and locate the places on a map.

13. Invite a local supermarket manager to speak to the class about where foods and household items come from. Where are poultry and meats produced?

Where do fruits and vegetables come from? Where are the fruits and vegetables we eat in winter raised? Does the way they are packaged (frozen, fresh, canned) make a difference?

14. Using ACT-1 and ACT-2, have students follow the egg from hen to the supermarket. Remember--eggs are pre-packaged with no preservatives. Ask students what they think this statement means.

15. Discuss food prices and the efficiency of our agricultural system. Put the following chart on the blackboard, so students can compare costs of food:

Country	% of disposable income spent on food	Minutes Worked to Earn:		
		1 lb. beef	1 lb. bread	1 dz. eggs
United States	16.2	16	4	6
Soviet Union	34	60	8	71
Japan	23	174	7	12
India	59	NA*	46	131
Brazil	41	135	43	73
Australia	17	22	4	11
China	60	455	NA**	205
Mexico	40	132	52	62
France	20	34	8	13

*Cows are sacred in India
**Don't eat bread

16. To aid the students' understanding of the importance of balancing imports and exports, explain that every country has only a limited amount of money. The amount is usually based on the amount of silver or gold the government owns. Discuss how we export agricultural products and import other items.

17. Key to "Eggs from Hen to Home."
    1. Laying
    2. Collecting
    3. Grading
    4. Sorting
    5. Packing
    6. Cooling
    7. Transporting
    8. Selling

PIONEER MEALS IN IOWA

Thomas and Sarah live on a small farm in rural Iowa. In 1750, nine out of ten people lived in rural areas. Most of their food is grown in their garden or produced on the farm. The food they do purchase comes from peddlers or from farm markets. Supermarkets and food stores were unheard of.

Thomas and Sarah keep busy helping their mother prepare the meals. Before a meal can be served, many chores must be finished. The fire had to be built and tended, bread baked, cows milked, butter churned, vegetables picked and cleaned, and so on. There was no time for preparing fancy or complicated dishes. Nearly everything for a meal went into one large kettle and was cooked together over the open hearth. Most families could afford only one large iron cooking pot.

Breakfast was commonly a bowl of porridge or cornmeal mush with cider. The midday dinner was generally the remainder of the stew from the previous night. Bread was baked once a week if there was an oven. If there was no oven, some bread stuffs could be baked in pots or skillets on the hearth. Their diet varied with the seasons, with their success in raising crops and livestock, and with the availability of food in the wild.

Most meat was tough. Hogs generally foraged, and the quality of the pork did not compare in tenderness or taste with the modern grain-fed product of Iowa. Beef was stringy and had to be pounded, mashed or chopped to be edible. Stewing was the only way to make it edible. Venison and other game were available in many areas as well as fowl, both domestic and wild. Seasoning was done primarily with wild herbs. The most common sweetner was molasses.

Thomas and Sarah looked forward to feasts on holidays and other special occasions. At harvest time, Thanksgiving, or for funerals and weddings, people pooled their food and labor to provide greater variety.

How Food Gets From The Farm To Your Table

"Hi! What's to eat?" How many times have you asked your parents that question? Probably a lot, right? Then, just as you are about to sit down at the table, someone says: "Don't forget to wash your hands." So you rush off to the bathroom, and when you return, breakfast is on the table. This morning there's cereal, toast, butter, milk, and, of course, a big glass of orange juice. Everyone is in a hurry this morning, so breakfast is fast and simple. You look forward to weekend breakfasts of bacon or sausage, eggs, and sometimes waffles or pancakes.

But stop! Did you ever wonder where all that food came from? "Sure," you say to yourself, "That's easy. The eggs came from a chicken, the bacon or sausage from a hog, the orange juice from an orange which grows on a tree, the cereal and bread from grain, and the milk from a cow. Everybody knows that." But how did all that food get from where it started--the farm--to where it's going to end up--your stomach?

Well, there are three important steps in getting that food to you. The first is called production. Somebody has to raise the chickens and the cows, and grow the trees and plants that produce the food you eat. That person is the farmer. The next step is processing. Milk, for instance, must be processed to make sure its safe to drink when it reaches your table. Almost all food is processed or packaged in some way. The third step is transportation. Food must be moved from the processing plant to the store where you buy it.

Each of these steps--production, processing, and transportation--plays an important role in almost all the food you eat. Without these steps, you might never be able to say: "Hi! What's to eat?"

From The Dairy Farm To Your Table

MILK

Maybe you thought that reindeer were only good for pulling Santa's sleigh. But did you know that in places around the North Pole, people get their milk from reindeer? Sheep provide much of the milk in Italy and Spain. In India the water buffalo gives people their needed milk and in Arabia people get their milk from camels. Here in the U.S., most of our milk comes from cows. Here's how it gets from the cow to your table.

First, the cow is hooked up to a milking machine. Often eight cows are milked at one time with four cows on each side of the "milking parlor." Next, the milk begins to spurt into clean glass jars. The jars fill up with foamy milk. It takes about 11 minutes for the average group of cows to be milked. When the cow is finished, the warm milk goes through a glass pipe to a cold tank that chills the milk and holds it at a temperature of about 40°F. The cold temperature keeps bacteria from growing and keeps the milk fresh and tasty.

From the chilling tank, the milk is pumped once a day into a huge tank truck that hauls it to a processing plant. When the milk arrives at the processing plant, it is heated to more than 160°F for about 15 seconds and then it is immediately cooled. This process is called pasteurization. The high heat kills any bacteria that may be in the milk.

In some plants the milk is made into cheese, butter, powdered milk, ice cream and many other products. If, however, the milk is going into cartons for you to drink, it is put through a machine that breaks the fat into tiny droplets. This is called homogenization because the milk and cream are now mixed together. Most people think homogenized milk tastes better than milk that is not homogenized. When milk stands in the refrigerator, the milk and cream stay mixed instead of the cream rising to the top. Most dairies then add vitamin D to the milk to make it more nutritious. This helps the food value. Sometimes, other vitamins are added too.

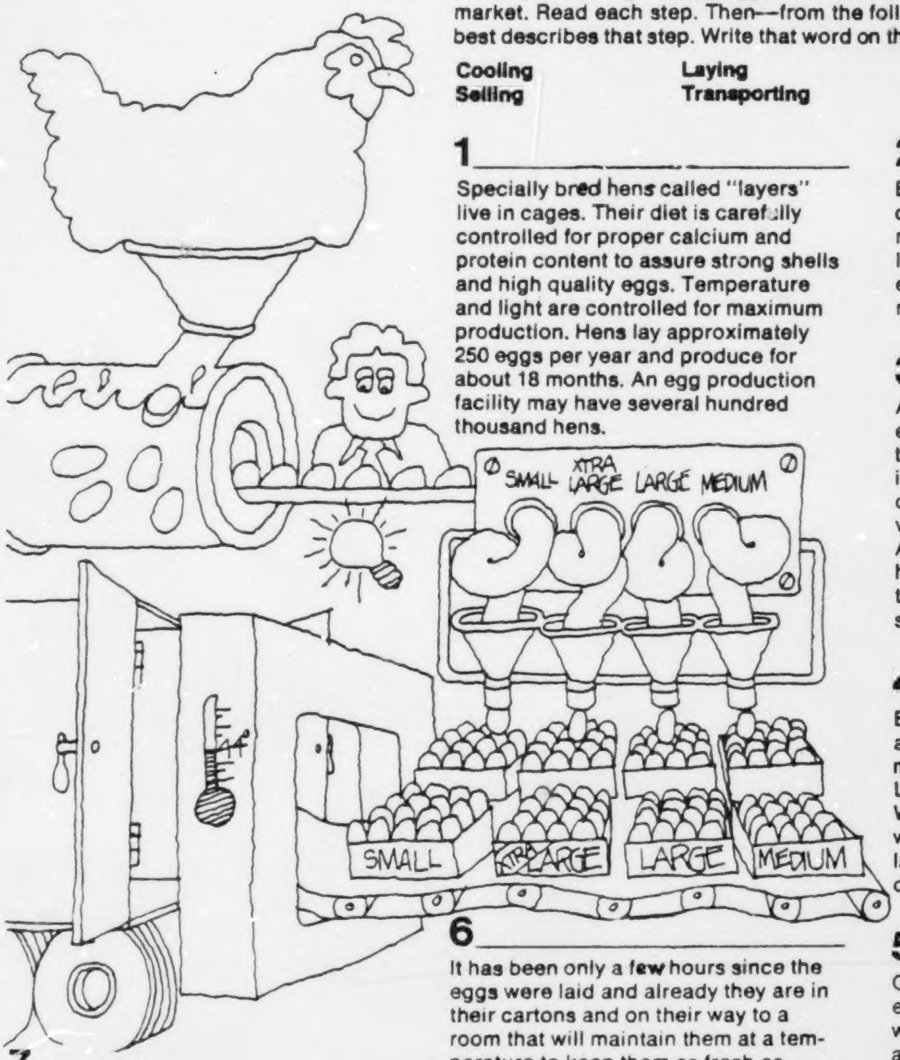
The milk then goes to packaging machines. The machines fill and seal the cartons or bottles, which are stored in refrigerated rooms. Soon, trucks arrive to pick up the milk, deliver it to stores, and--well, you know the rest.

UNIT 3
INFO-3

Eggs from Hen to Home

Below you see eight steps eggs travel as they move from the hen to the supermarket. Read each step. Then—from the following list—choose the word that best describes that step. Write that word on the line by each step.

Cooling	**Laying**	**Grading**	**Sorting**
Selling	**Transporting**	**Packing**	**Collecting**



1 ____________________

Specially bred hens called "layers" live in cages. Their diet is carefully controlled for proper calcium and protein content to assure strong shells and high quality eggs. Temperature and light are controlled for maximum production. Hens lay approximately 250 eggs per year and produce for about 18 months. An egg production facility may have several hundred thousand hens.

2 ____________________

Eggs are gathered either daily or continuously and washed by automated equipment. A tasteless, odorless, harmless oil is sprayed on the eggs after washing to replace lost natural protection.

3 ____________________

A process called "candling" allows examiners to see any imperfections there might be in the shell and in the interior of the egg and to check the size of the air cell. Candling is often supervised by the U.S. Department of Agriculture. Eggs which do not meet high USDA standards cannot receive the USDA grade A or better and are not sold in supermarkets.

4 ____________________

Eggs are separated by weight and automatically sent on to another machine. USDA sizes are Jumbo, Extra Large, Large, Medium, Small and Pee Wee and are based on minimum weights per dozen. Older hens tend to lay larger eggs. Pee Wee eggs usually don't show up on supermarket shelves.

5 ____________________

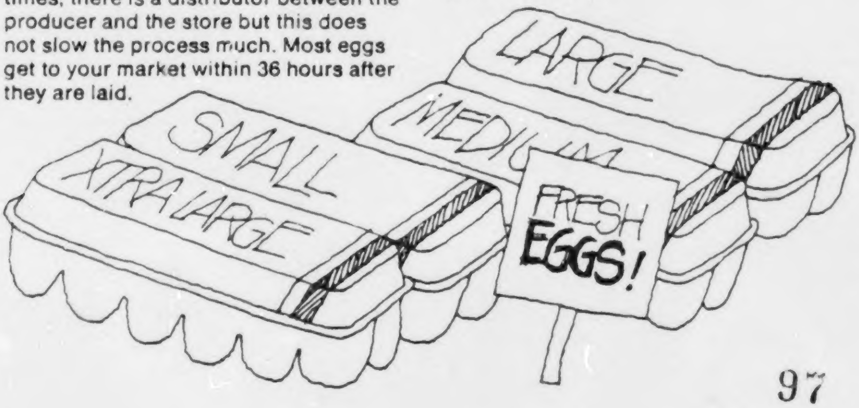
Graded and sorted eggs are put in either one-dozen cartons like those we buy at the store or in "flats" which are used by restaurants. It's all done automatically.

6 ____________________

It has been only a few hours since the eggs were laid and already they are in their cartons and on their way to a room that will maintain them at a temperature to keep them as fresh as possible. An egg left at room temperature for two or three days will lose one grade of quality.

7 ____________________

Refrigerated trucks speed eggs from the cooler to the supermarket. Sometimes, there is a distributor between the producer and the store but this does not slow the process much. Most eggs get to your market within 36 hours after they are laid.



8 ____________________

At the store, eggs are stored and displayed in temperature controlled cases. Your store may offer a selection of sizes and grades.

From hen to home, your eggs have been carefully handled, inspected and packed. In this unit, you will learn more about eggs: their various parts, how they are graded and sized, how to store them at home, how eggs fit into your daily diet, and how to properly prepare eggs in many different ways.

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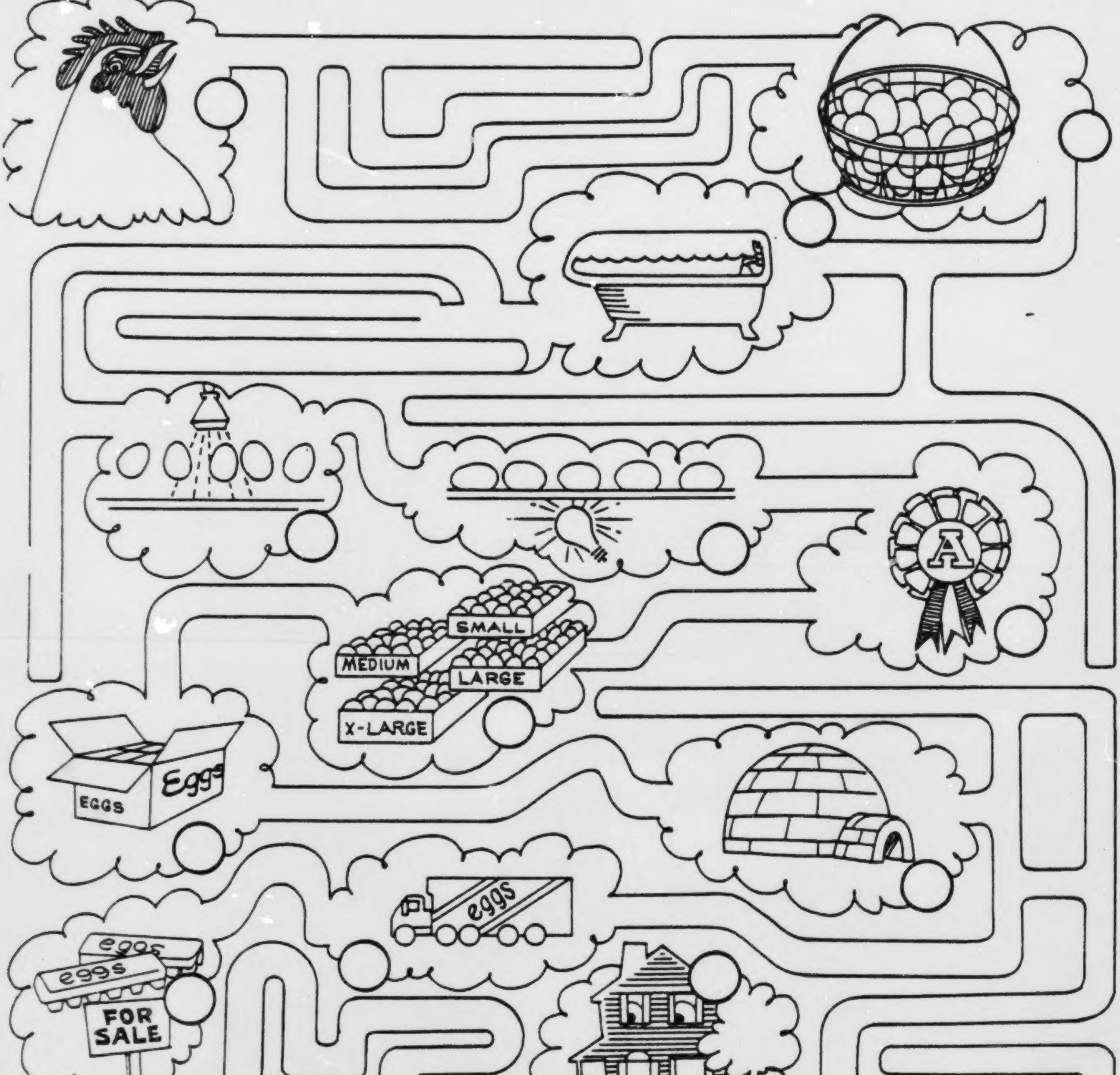
ACTIVITY MASTER 2:

The A*MAZE*ING EGG: from Hen to Home

1. Laying
2. Collecting
3. Washing
4. Treating
5. Candling
6. Grading
7. Sorting
8. Packing
9. Cooling
10. Shipping
11. Selling
12. Storing

Below are the steps that an egg follows on the journey from the hen to the home. Number the pictures to show the same order. Then trace the steps through the maze until the egg reaches your refrigerator. Don't get lost along the way!



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Unit 4
Chapter 2

THE MANY ROLES OF AGRICULTURE

Agriculture serves many functions and plays many roles to protect our soil, water, plants, animals and YOU. Among these roles, agriculture:

1. Assures the wholesomeness of the food you eat
   As required by Federal law, all meat, poultry, and egg products must be inspected for wholesomeness. These products must be certified as safe to eat by either Federal or State inspectors. The law also requires that products be truthfully labeled and specifies sanitray levels in processing plants.

2. Protects plant and animal health
   Every year diseases and pests destroy more than 5 billion dollars worth of crops and animals. Without the battles won by botanists, entomologists and veterinarians, that figure could be two or three times higher with even higher food bills as a result. Foreign pests and diseases can cause more damage here than in their native lands, so U.S. agricultural quarantine inspectors guard our borders to prevent introduction of these pests and diseases.

   Wherever possible, biological controls such as viruses, bacteria, parasites and other natural enemies are being used against insect and weed pests. However, chemical pesticides are still the most effective way to control insect and weed pests.

   An "integrated system" of combining both biological and chemical controls is now being used to minimize environmental hazards. Livestock and poultry in this country are ranked among the healthiest in the world, largely because of the broad program aimed at eradicating animal diseases. Fowl plague, cattle tick fever and sheep scabbies have been completely eradicated while active campaigns are underway to wipe out cattle scabies, brucellosis, tuberculosis and equine encephaslitis.

Thirty years ago, we had only a half dozen animal vaccines. Today more than 200 vaccines and related products help prevent more than 60 different diseases. Each of the vaccines and products have been tested to be sure they are safe, pure and effective.

3. Serves the environment by protecting our soils and water

In cooperation with the Soil Conservation Service (SCS) and the more than 2,950 local conservation districts across the nation, ranchers and farmers are protecting water and soil resources on more than 800 million acres of land.

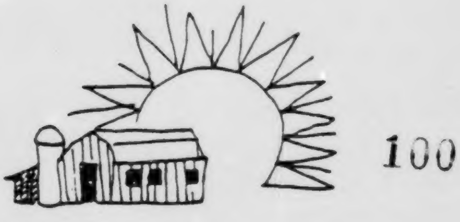
To control sedimentation and erosion, farmers protect sloping cropland with more than 100,000 miles of parallel terraces and use minimum tillage on more than 40 million acres. Millions of additional acres are protected by windbreaking, contour farming, stripcropping, and permanent vegetation to conserve soil and water.

Water supplies are protected by installing more efficient irrigation systems, improving existing systems and by practicing better management to conserve water. The SCS also helps builders, developers and local and state governments solve land and water use problems. Conservation practices control flooding and pollution, provide wildlife habitats, improve the quality of our water, land and air and beautify the nations rural landscape.

4. Protects our forests

One-third of the total land surface in the U.S., approximately 753 million acres, is tree-covered. However, only 187 million acres lie within the National Forest System. Most of the country's forest lands are privately owned.

The U.S. Department of Agriculture's Forest Service has federal authority for exercising national leadership in forestry for both public and private forest lands. The Forest Service (1) carries out cooperative forestry research programs to seek improved growth and more complete utilization of timber resources; (2) conducts multiple-use programs within the National Forest System; and (3) cooperates with State and private forest groups in sponsoring cost sharing programs which emphasize protection, management and utilization on all forest lands.



5. Serves everyone through agricultural research

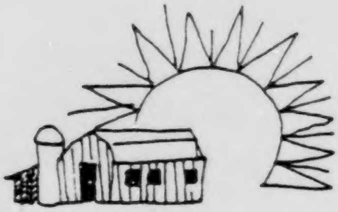
Everyone benefits from agricultural research. Research discovers ways for farmers to till, plant and harvest crops more efficiently, and to produce more and better quality milk, meat and eggs. Research gives industry improvements in processing, packing, storing and transporting of agricultural products. The consumer gets newer and more convenient foods and fabrics.

The USDA's Agricultural Research Service laboratories have brought about revolutionary changes in livestock breeding, feeding and marketing. These changes have made it possible to put more meat and poultry on the table than was possible 20 years ago. The development and use of mechanical harvesters have eliminated millions of hours of hand labor in vegetable and fruit harvesting.

Some of the research is carried out by Iowa State University. The research is partially funded by farmers. When farmers sell grain or livestock a certain amount of money is deducted from the paycheck to go for research and promotion. The check-off is not mandatory and can be refunded. Each year farmers contribute hundred of thousands of dollars toward research.

Private agricultural research is believed to be roughly equivalent to that conducted by public agencies such as the USDA. Research staffs are maintained by practically all large manufacturers of seed, fertilizer, feed, pesticides and farm machinery. They are also maintained by firms engaged in transportation, packaging, processing and merchandising of agricultural products.

Current research information and findings are disseminated to the farmer and consumers through the Cooperative Extension Services which identify local needs and help people to acquire the understanding, capabilities, attitudes and skills essential for solving farm, home and community problems. Research information also reaches farmers and the public through the press, radio and television. Agribusiness firms communicate with farmers and others through advertising. Supplier firms and agricultural commodity groups are also important distributors of new knowledge.



SUGGESTED ACTIVITIES:

1. Discuss how meat, poultry, milk and egg products are inspected, graded and certified. Have students bring in egg cartons, milk cartons and meat packages. Read the inspection and grading labels.

2. Invite a Federal or State veterinarian or livestock inspector to talk to the class. Ask about testing programs at livestock yards and meat packing plants. If available, also invite a meats inspector to talk to the class about inspection and grading.

3. If possible, conduct a field trip to a meat processing plant or to a State laboratory.

4. Invite a local veterinarian or farmer to discuss health and management practices in caring for animals. If not available, contact the local vocational agriculture department. The high school vocational agriculture students could disucss care of animals, management and facilities.

5. Locate farm magazines. Have students collect pictures of vaccines, chemicals, etc. Make a collage.

6. Using INFO-1, read and discuss the use of chemical fertilizers and chemical pesticides. Discuss proper care and use of chemicals. Remind students that many chemicals can be poisonous and hazardous. Draw the poison symbol. See if students can think of insects that are used as biological controls (i.e., preying mantis).

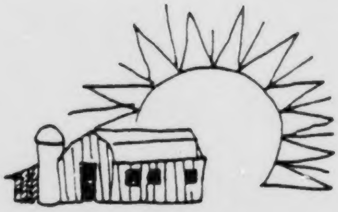
7. Using ACT-1, conduct the soil transportation experiment. Student can use the accompanying worksheet to record their results. Discuss sedimentation and erosion management practices such as:
    - minimum tillage
    - no tillage
    - contour farming
    - terracing
    - windbreaking
    - stripcropping

   The class could be divided into teams to research the practices and give oral reports.

8. Invite the local agricultural extension agent to talk to the class about their county, its soil and conservation practices. Discuss the importance of soil to agricultural production.

9. Invite a Soil Conservation Service resource person to talk to the class about conservation practices to control flooding and pollution, and water quality improvements.

10. Discuss the role of water in agricultural production and transportation of agricultural products (i.e., grain barges on the Mississippi). Discuss what happens when water sources are not available. Discuss irrigation and irrigation practices.



Unit 4
Chapter 3

AGRICULTURAL BY-PRODUCTS

Agriculture provides us with more than just food and clothing. It is an important source for medical, industrial, consumer, and research by-products. By-products include the edible and inedible products that are developed from the animal or grain.

Animal By-Products

A thousand pound steer does not result in 1000 pounds of hamburger. In fact, a thousand pound steer will yield about 432 pounds of beef. A 220 pound hog will yield about 122 pounds of saleable pork cuts. The rest of the carcass is not wasted but made into important products we use everyday.

The leather from the hide of animals is the most well known by-product. It gives us shoes, coats, belts, footballs and even baseball gloves.

Pharmaceuticals are an extremely important by-product. Perhaps the best known drug is insulin. It is used to treat sugar diabetes. There are six million diabetics in the U.S. alone and 1.25 million of them require insulin daily. Insulin is developed from the pancreas gland of cattle and hogs. It takes the pancreas gland from 26 cattle or 60 hogs to provide enough insulin to keep one diabetic alive for one year. Insulin is a protein drug and it is very difficult to synthesize it in the laboratory so animal sources are extremely important.

Hog heart valves have been used in more than 35,000 heart operations since the first valve implantation in 1971. Hog valves are superior to mechanical valves since mechanical valves often stick and anticoagulants must be used. Hog heart valves have been implanted in men, women, and children ranging in ages from less than one year old to more than 70 years old.

Other drugs developed from animals are used to treat shock, arthritis, asthma, restore heart rhythm in cardiac arrest, develop vaccines, dissolve gallstones, thin blood during surgery, speed up healing, and treat ulcers.

Some other by-products include:

- Sticking Agent
- Leather Treating Agents
- Plywood Adhesive
- Protein Source in Feeds
- Fabric Printing & Dyeing
- Glue
- Garments, Gloves & Shoes
- Buttons
- Bone China
- Mineral Source in Feed
- Fertilizer
- Porcelain Enamel
- Glass
- Water Filters
- Insecticides
- Weed Killers
- Lubricants
- Candy
- Antifreeze
- Printing Rollers
- Ornaments
- Insulation
- Chalk
- Matches
- Paper Sizing
- Oil Polishes
- Rubber
- Soap
- Explosives
- Sports Equipment
- Floor Waxes
- Water-Proofing Agents
- Cement
- Fiber Softeners
- Crayons
- Photographic Film
- Sand Paper
- Violin Strings
- Oleo
- Gelatin
- Marshmallows
- Natural Sausage Easings
- Cosmetics
- Plastics
- Cellophane
- Artist Brushes
- Upholstery
- Phonograph Records
- Putty
- Linoleum

Plant By-Products

Corn and soybeans yield many by-products that we use everyday. Fructose is one of five common sugars found in nature. It is the substance that gives berries, fruits and certain vegetables their natural sweetness. Corn has a high fructose content and, as the most abundant crop in America, provides over 25% of the natural sweetners used today. Fructose sweetens foods as good as, or better than, common table sugar. Research is being done with fructose and its effects on diabetes and dental decay. The preliminary results look very promising. Fructose is being used to replace artificial sugars, like saccharin and cyclamates in low calorie foods and soft drinks.

Gasohol is another important by-product of corn. Gasohol is corn, distilled to alcohol, mixed with gasoline. One part corn alcohol is mixed with nine parts regular gasoline to make gasohol. Gasohol may be purchased at most gas stations.

Corn starch, corn oil, and corn syrup are just a few more of the by-products used everyday.

Here is a partial listing of some corn and soybean by-products:

Antibiotics
Adhesive
Linoleum Backing
Explosives
Protective Coatings
Rubber
Noodles
Particle Board
Vitamins
Electrical Insulation
Margarine
Candy
Wallboard
Livestock Feeds
Cooking Oils
Soap
Textiles
Infant Milk Drinks
Insecticidal Sprays
Fertilizer
Disinfectants
Chocolate Coating
Bread
Plywood
Texture Paints
Starch
Putty
Cosmetics
Cereals
Tape Joint Cements
Paper Coating
Printing Inks
Shortening

Suggested Activities

1. Discuss how many pounds of hamburger, steaks, and chops come from the average 1000 pound steer and 220 pound hog. Introduce the concept of by-products.

2. Using INFO 6 discuss how important agricultural products are to your life. Have the students finish writing the story using agricultural by-products.

3. Using the blackboard, have the students name things made from agricultural by-products. (It will be hard to think of things that are not developed from an agricultural product in one way or another. Almost everything starts on the farm!)

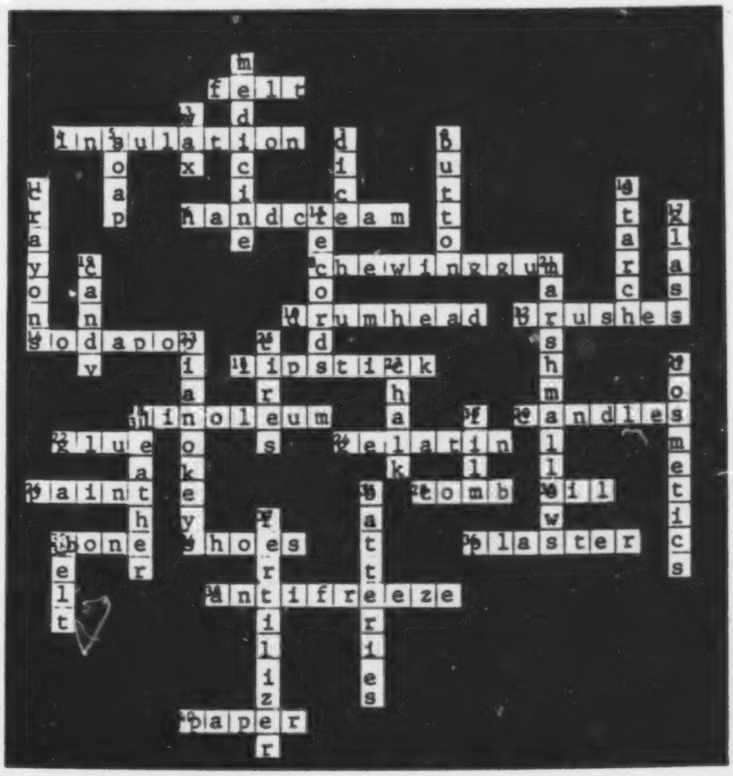
4. Have the students clip out pictures from old magazines of things that start on the farm. Develop a collage of things made from agricultural by-products.

5. Using ACT 4 have the students fill out the crossword puzzle. Correct them in class and as you go over the correct answers, ask the students where each product came from. Example: felt is made from by-products of lamb, beef, and pork production.

6. Have the student collect empty packages, boxes, materials and items from home that started on the farm. Make a display or set up a table of by-products in the classroom.

7. Have students taste regular cane sugar and corn fructose. The fructose is 2/3 sweeter than regular sugar. Fructose can be purchased in most supermarkets.

Answers to AGRICULTURAL BY-PRODUCTS Crossword Puzzle



Key

Across

2. felt
4. insulation
6. handcream
8. chewing gum
10. drum head
12. brushes
14. soda pop
18. linoleum
20. candles
22. glue
24. gelatin
26. paint
28. comb
30. oil
32. bone
34. shoes
36. plaster
38. antifreeze
40. paper

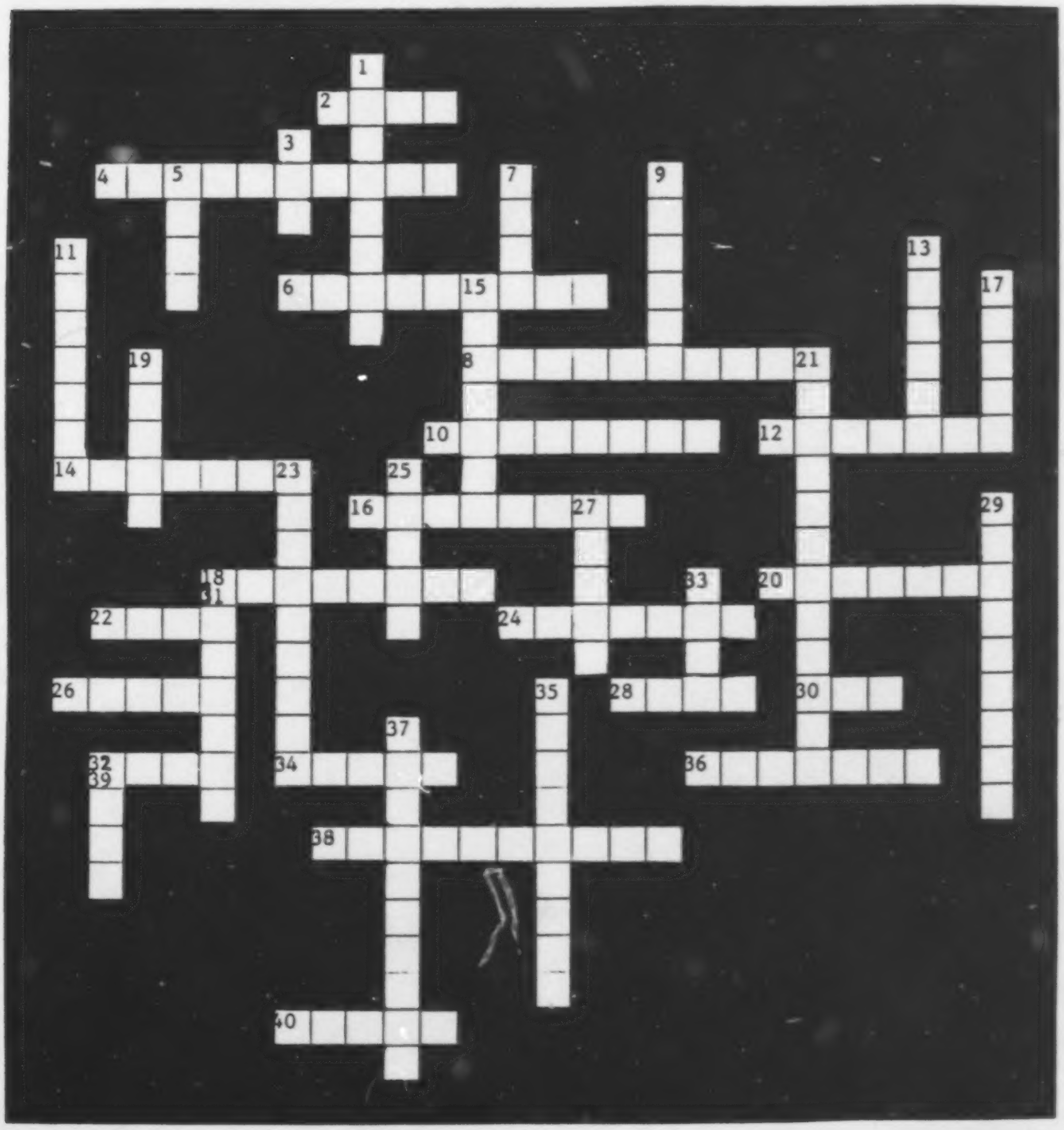
Down

1. medicine
3. wax
5. soap
7. dice
9. button
11. crayons
13. starch
15. records
17. glass
19. candy
21. marshmallows
23. piano keys
25. tires
27. chalk
29. cosmetics
31. leather
33. film
35. batteries
37. fertilizer
39. belt

AGRICULTURAL BY-PRODUCTS

Many things you use everyday are developed from a by-product of agriculture. The following are by-products of beef, pork, lamb, corn, or soybean production. Many things use a combination of more than one agricultural by-product.

Read each clue and fill in the crossword puzzle for the product described.



ACROSS

2. This material is often used to make hats and crafts.
4. This is used in the walls and the ceiling to keep the room warm.
6. This will keep your hands soft.
8. Something that you chew.
10. The top part of a drum.
12. Something that you paint with.
14. A favorite beverage often made with a sweetner from corn.
16. Something your mother might use to make her lips red.
18. A type of floor covering.
20. Something you find on your birthday cake.
22. This is used to make papers stick together.
24. Something you might have for a salad or dessert.
26. This product adds color to walls.
28. Something that you use to make your hair neat.
30. A liquid used in frying.
32. A very special kind of china.
34. Something you wear on your feet.
36. This is used in making walls.
38. This liquid will allow your car to run in cold weather.
40. Something you write on.

DOWN

1. Something you take when you are sick.
3. This keeps the floor shiny.
5. You use this to keep clean.
7. You use these small objects when you play games.
9. Something you use to fasten your shirt.
11. Children like to use these to color pictures.
13. Something that makes your clothes stiff.
15. Something that you play on a phonograph.
17. You can see through this.
19. Something that is sweet.
21. These taste great roasted over a fire.
23. You play these to make music.
25. Four of these are needed for a car.
27. Your teacher uses this to write on the blackboard.
29. Women use these on their faces.
31. This is used to make coats and shoes.
33. This enables a camera to take a picture.
35. Something that is used in a flashlight.
37. Something that makes plants grow.
39. You wear this around your waist.

Do you know where each product came from?

Is a day without agriculture possible?

We depend upon agriculture for much more than just our food and clothing. Let's take a look at an average day and some of the agricultural products and by-products you might use.

You wake up on sheets of cotton that have been woven with cornstarch for sizing. You turn on the transistor radio - the dry cell batteries contain cornstarch. You step out of bed onto a carpeted floor. The rug pad underneath the carpet is made with hair from the hide of cattle. As you reach for your robe, you might notice how warm it is in the house. The insulation used in the walls is produced with a by-product from cattle and hogs. The plaster on the walls is made with a binder produced from the hide of hogs and cattle. The wallboard also contains cornstarch and soyflour from the soybean.

The soap you use to wash your face is made from by-products of corn, soybeans, and cattle. The comb you use to comb your hair is a by-product of cattle.

At the breakfast table, you notice that everything came from agriculture in some form or another. The food might have been made sweet by a new corn sugar called fructose. As you eat, you remember your homework assignment that you finished last night, the paper you wrote it on, contains a corn and soybean by-product that helped hold the ink.

The tires on the school bus are made with a by-product of beef, stearic acid, that is very important to make the tires run cooler and so last longer. The bus might be fueled by gasohol which is grain alcohol made from corn and gasoline.

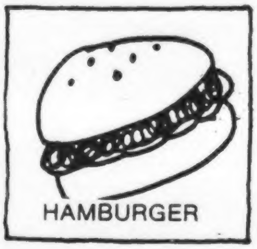
You arrive at school ready for a great day made possible by agricultural by-products.

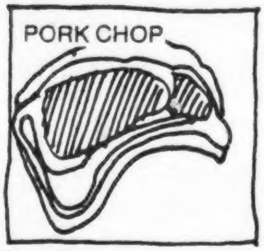
Can you finish the story using other agricultural by-products?

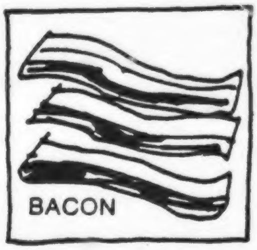
BEEF AND PORK COVER-ALL

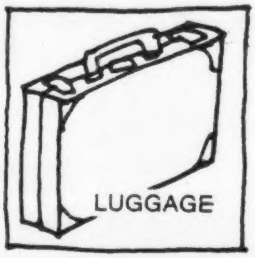
DIRECTIONS: Play a game of cover-all with beef and pork and their by-products. First, cut out the markers at the bottom of this page. Then cover each spot on the game board below as your teacher calls out each space.

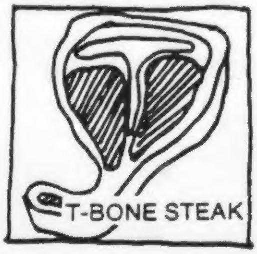
If something comes from beef, you must cover that space with a beef animal. If something comes from pork, you must cover that space with a pig. If the by-product could come from either animal—you should place a pig *and* a beef animal on the space.

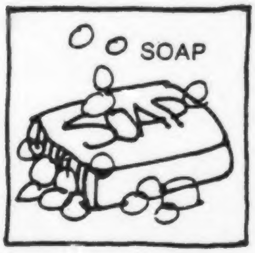


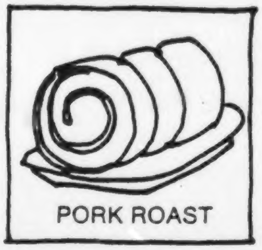


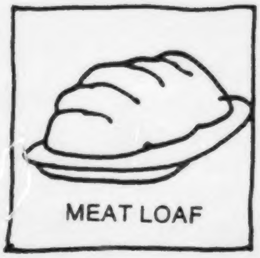












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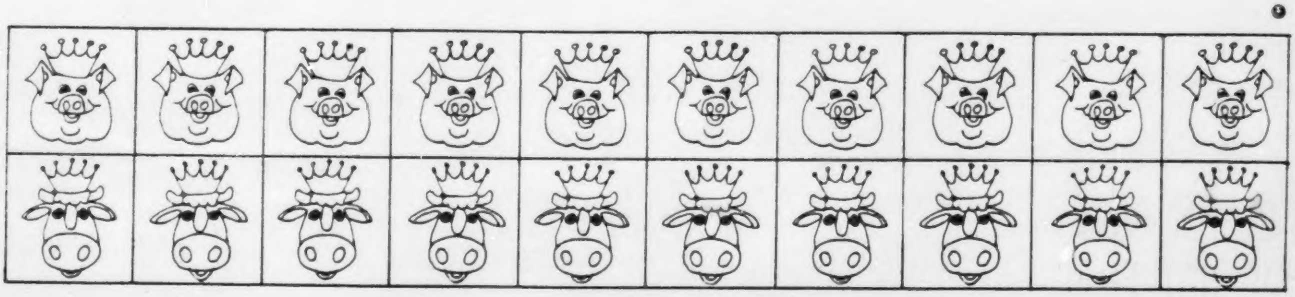


FUN WITH FOOD, FACTS AND FANTASY

Unit 4
FUN-1

When people think about food crops, they usually think about corn, or tomatoes, or even wheat. But few ever think about soybeans. Yet, soybeans give us salad oil and many other products. If a soybean could talk, what do you think it would have to say for itself? You can't be sure, but an interview with a soybean might go like this.

An Interview With A Soybean

Video:	Good evening. I'm Video, and I'm here in Iowa at the farm of the Soy Bean family. As you can see, the Soy Bean family is upset. They say they get no respect. Tonight, we'll be talking with the head of the Soy Bean family, Mr. Soy Bean himself.
Soy:	Good evening.
Video:	Good evening, Bean.
Soy:	Call me Soy.
Video:	Thank you. I must say you're looking fresh as a daisy.
Soy:	(Upset) Fresh as a daisy! See what I mean? Even daisies get more respect than soybeans! Why didn't you say "fresh as a soybean?"

Video: Excuse me. I didn't mean to upset you.
Soy: (Feeling sorry for himself/herself) Soybeans get no respect.
Video: Perhaps if we knew a bit more about soybeans, that would help.
Soy: (Cheered up a little more) That sounds like a good idea. What would you like to know?
Video: Why don't you begin by telling us where soybeans come from.
Soy: (Playfully) Guess!
Video: Well, judging from your name, I'd say you come from China.
Soy: (Disappointed) How'd you guess?
Video: Just lucky, I suppose.
Soy: Well, you're right. Soybeans have been grown in China for 3000 years. But a lot of people think soybeans came from Cleveland.
Video: Cleveland? You're kidding!
Soy: Yeah, I am. That was just a little joke. Soybeans have a great sense of humor.
Video: I can tell.
Soy: Actually, I do have an uncle who grew up in Cleveland. But, today more soybeans live right here in Iowa than in any other state. We soybeans also grow well in Illinois, Missouri, Arkansas, and Indiana.
Video: I didn't know that.
Soy: Well, here's something else I bet you didn't know. More of us soybeans grow up in the United States than in any other country--including China.
Video: No, I didn't know that.
Soy: You've probably never given us Soybeans any thought at all.
Video: Well, now, Soy, that's not exactly true. Why, just last night I asked the waiter to bring me some soy sauce for my Chinese dinner.
Soy: Soy sauce! Is that all you think we're good for?
Video: Well, I don't know. Perhaps, you could tell us: What are you good for?
Soy: What am I good for? Are you crazy? I guess it never occurred to you that soybeans are used as feed for livestock and food for you human beings, and are even used in some of the products you buy, like plastics, paint, varnish, candles, and soap.
Video: Hey, that's interesting.
Soy: You bet it is. But nobody ever gives the soybean credit for all those things. Even carrots get more credit than soybeans do.
Video: What do you mean?
Soy: All over the country, you hear parents tell their kids, "Eat your carrots. They're good for your eyesight." You never hear anyone say, "Eat your soybeans," do you?

Video: You, uh, do have a point.

Soy: Well, here's another little tidbit of information. In many countries, people eat soybeans instead of meat, eggs, or cheese. That's because soybeans are a good source of high-quality protein. And they're a lot cheaper than those other foods, too.

Video: Perhaps, you could tell us exactly how soybeans are used.

Soy: Okay, but I'm only going to say this once, so listen carefully. You see, first we soybeans produce seeds. Are you with me?

Video: So far, so good.

Soy: After soybeans are harvested, the seeds are cleaned. Then they are crushed into flakes. And oil is removed from those flakes.

Video: And then the flakes are just thrown away, right?

Soy: Not on your life! Those flakes make up soybean meal which is fed to livestock. Over 90 percent of the soybean crop is fed to animals. The rest of the soybean meal is further processed in different ways, and added to foods like baby food, cereals, even candy. It provides an extra protein source for these foods.

Video: What happens to the soybean oil?

Soy: I'm glad you asked that. About 90 percent of the oil is used for food products. About half of that is used for vegetable shortening and margarine. Think about that.

Video: H'mmm. I will.

Soy: Anyway, the other half of the oil that is put in food is used for mayonnaise, salad dressings, and cooking oils.

Video: That's fascinating.

Soy: And you thought all we did was make a little soy sauce. Let me tell you, we soybeans are one of America's most important and versatile crops.

Video: I apologize.

Soy: Listen, I don't have all day to stand around gabbing, so if you're going to ask me about pests, you better hurry up.

Video: Pests?

Soy: Sure, pests. Most snoopy reporters who come around here ask about pests and pesticides.

Video: Okay, what about pests?

Soy: They're real pesty! Har-dy-Har-Har-Ho-Ho! Boy, you really fell for that one, didn't you? I told you we soybeans have a sense of humor.

Video: Yes, I can see. You're just a regular Steve Martin of the soybean set.

Soy: Actually pests are mostly weeds and some insects and they used to be a bigger problem for us soybeans than they are today. Farmers have learned how to control those pesty old things. The farmers now have a lot of different pesticides to kill the weeds and insects--they help to protect us.

Video: I'm glad to hear that.

Soy: Not nearly as glad as we are.

Video: Just one last question, Mr. Bean. How does the future look for you and your family?

Soy: Terrific. Absolutely terrific. Why, it's possible we could someday provide the calories and protein for all the peoples of the world.

Video: That's what I call a bright future! Well, I want to thank you for taking the time to talk with us this evening.

Soy: (Shyly) I must admit I was a little nervous in front of the camera.

Video: Oh, really? You seemed cool as a cucumber.

Soy: Cool as a cucumber! See! There you go again. Why couldn't you have said "Cool as a Soybean," or "Smart as a Soybean," or "Delightful as a Soybean."

Video: I apologize.

Soy: (Feeling sorry for himself again) Soybeans get no respect.

Video: Maybe I could help you come up with a nice soybean slogan.

Soy: Now you're talking! What do you have in mind?

Video: Well, from what you've told me, soybeans seem like very strong, healthy, reliable plants.

Soy: Oh, we are! We are!

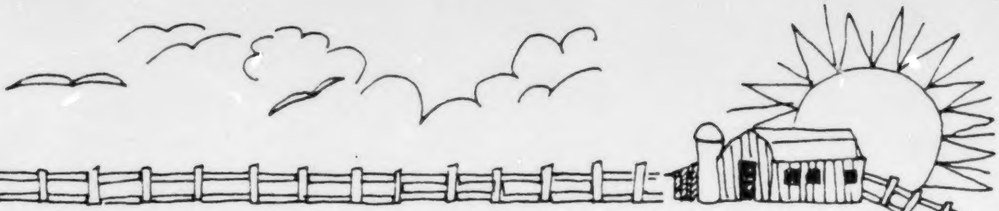
Video: So, how about this: "Sound as a Soybean!"

Soy: I like that. It has a nice ring to it. (Proudly) Sound as a Soybean!

Video: Once again I'd like to thank you for sharing this time with us.

Soy: Oh, you're welcome, very welcome. (Proudly) Sound as a Soybean. I like that!

Adapted from "What's to Eat?" The United States Department of Agriculture Yearbook, 1979.



Unit 5

IOWA - THE LAND AND ITS PRODUCTS

As Iowans, we have a lot to be proud of! Iowa contains 25% of the richest agricultural land in the world. This, along with a temperate climate and adequate rainfall, enables Iowa to be the "breadbasket of the world."

Soil plays an important factor in producing crops. Over 750,000 years ago the first glacier covered Iowa. It brought with it the rich soil from Canada and Minnesota. It had a leveling affect on the landscape as it slowly moved south. After the first glacier melted, the second glacier appeared about 500,000 years ago and covered a portion of northern Iowa. The material that the glaciers left behind when they melted is called glacial till.

Wind and water also played an important role in forming Iowa's soils. The wind picked up material--sand, silt, clay and deposited it over the glacial till. In Eastern Iowa the loess is very thick and we have loess bluffs and hills. Soil transported by water (alluvium) is also very important to soil formation. Small particles of soil are picked up by the water and deposited downstream. A heavy rainfall can wash gullies in a hill and move large amounts of soil.

Temperature is also very important to crop production. The average annual temperature in 1980 for the state was about 49°F. The temperature ranged from a state average of 19.7°F in February to 77.3°F in July. Length of the growing season is critical to growing plants. The average growing season (last average spring killing frost to first average fall killing frost) is about 23 weeks.

Crop production also depends upon precipitation. Iowa averaged, in 1980, 29.5 inches of precipitation. The majority of this came from May to September in the form of rain. This is especially important to growing crops. More precipitation falls in eastern Iowa than western Iowa. This is important in determining what crops are grown in the different areas.

The statistics of Iowa's agriculture are overwhelming. One of the reasons is because agriculture is the basic industry in Iowa. About 36 percent of all Iowa workers depend directly on agriculture for their jobs and about two out of three Iowa workers depend, directly or indirectly, upon agriculture for their jobs. Iowa leads the nation in the number of firms engaged in manufacturing of farm and garden machinery and equipment. Iowa is the number one state in total farm population with 544,000 residents. In 1981, there were 118,000 farms in Iowa with an average size of 286 acres (one acre is about the size of a football field.) Each year the number of farms decline while the average size of the farms increase.

Iowa leads the nation in the production of corn for grain and total acres of principal crops harvested. In 1980, Iowa produced almost one and a half billion bushels of corn (22% of the total produced in the U.S.) and had a record breaking year for soybeans with 322 million bushels harvested (18% of the U.S. total). Iowa ranks second in the production of corn for silage, alfalfa hay, and third in the production of popcorn and oats. In 1978, Iowa exported over 1.7 billion dollars (14% of the U.S.) of soybeans, feed grains, and their products overseas. This is very important to the national economy to balance the money we spend on imports.

Iowa is famous for the production of livestock. Iowa ranks number one in hog production. Hogs and pigs on the farm at the beginning of 1981 totaled 16.1 million or 25% of the nation's hogs. That is equivalent to over 5 hogs for every man, woman, and child living in Iowa. Almost 95% of the pork produced and processed in Iowa is consumed elsewhere.

Iowa is also a leader in cattle, sheep, and milk production. Iowa ranks second in the nation in total cattle with 7.45 million head. Iowa leads the nation in the number of cattle feed lots with 33,000. Less than 300 feedlots have a larger capacity that 1,000 head. Iowa has the largest number of sheep producers in the nation with 14,000 producers. Sheep production is becoming more popular. In 1981, there were 485,000 head produced in Iowa -- a nearly 100,000 head increase since 1977. Iowa dairymen produced an estimated 4,108 billion pounds of milk during 1080. This is equivalent to 478 billion gallons of milk.

In 1979, we exported 359 million pounds of beef, lamb, and pork. Iowa's number one customer overseas in 1978 was Japan with a purchase of 352 million dollars in agricultural exports. The Netherlands was second and the U.S.S.R. third in the amount of U.S. porducts purchased. For all farm product exports in 1978, Iowa exported 2.1 billion dollars which is 37.8% of the U.S. total farm product exports ($27 billion). Iowa is ranked second in total farm exports in the United States.

Iowa is also a large producer of eggs. Iowa produces about 150 million dozen eggs each year. That means Iowa alone provides eight eggs for each person in the United States. At the beginning of 1981, there were 10.5 million chickens in Iowa. Out of this, there were 7.624 million layers (chickens that produce eggs). Each bird produced an average of 234 eggs during the year.

Iowa ranks seventh in the nation in turkey production. An Iowa turkey farmer produces enough turkeys for 107 people each year. Iowa ranks tenth in the production of honey. Bees are important in Iowa not only for their honey production, but also because they pollinate the field crops.

Teacher note: The ranking of Iowa compared to other states is given for 1981. The figures do change from year to year, but on the average, the rankings will stay the same. Current rankings and additional information such as how much each county in Iowa produces can be found in "Iowa Agricultural Statistics" published by the Iowa Department of Agriculture; Iowa Crop and Livestock Reporting Service. The address for this publication is 833 Federal Building, 210 Walnut, Des Moines, Iowa 50309.

SUGGESTED ACTIVITIES:

1. Ask students if they have visited other parts of the state--what did they see? Was the land hilly or flat? What type of livestock and crops did they see?

2. Using a large map of Iowa, discuss how the different areas of the state differ in land features (Eastern and Western Iowa is hilly. Central Iowa is flat), temperature, precipitation, and soil.

3. Discuss how glaciers affected Iowa's soil. Discuss how glaciers move soil.

4. Have each student select on farm product grown or produced in Iowa and write a short report on it. The report can include growing cycles, planting, harvesting, different types of production and problems the farmer might face.

5. Visit a local farm. For suggested farms to visit, contact your County Extension Agriculturalist, Vocational Agriculture Instructor, Farm Commodity groups or Farm Bureau. Pass out ACT 1 to the students before taking the field trip. Go over the different questions they might ask and have them write three questions on their own. Contact the farmer early and find out what time chores are done. Give the farmer a copy of ACT 1 so he/she will know what questions might be asked. If visiting a farm is not possible, have a farmer come in and talk to the class.

6. Using INFO 1, discuss the different farm products and where they are produced in the state. This can also be used as an overhead.

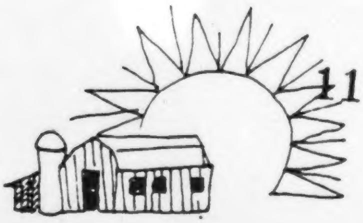
7. Using INFO 2, discuss the role Iowa plays in United States agriculture.

8. Using ACT 2, have the students complete the quiz. Use the quiz as a review of the importance of Iowa's agriculture.

9. Make a collage of all the things that are produced on an Iowa farm.

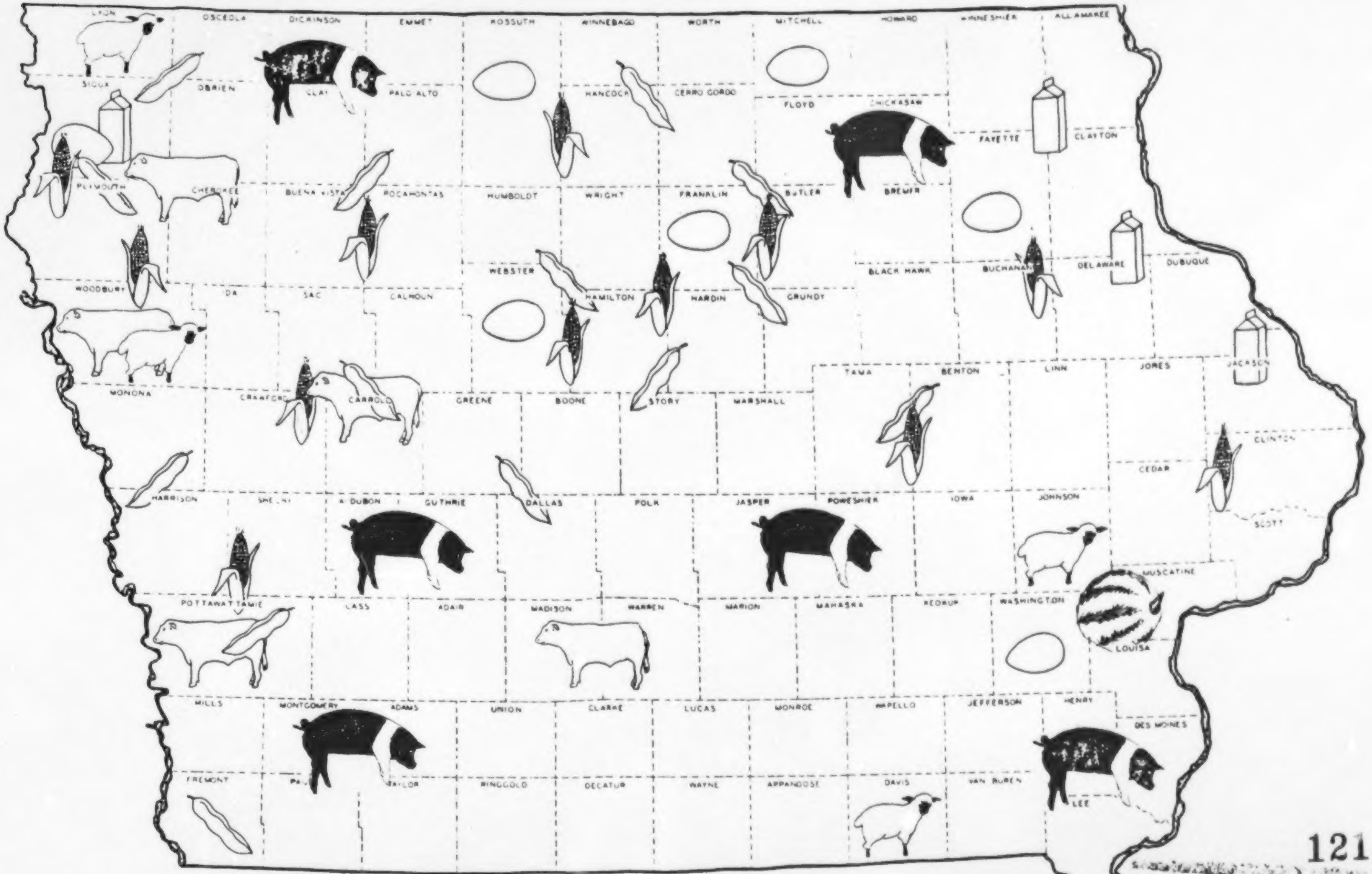
10. Have the students write a story about a farmer's day. Have the student chose different types of production and share their reports with the class.

11. Show the filmstrip, "Iowa's Agricultural Products - Where They Go and How They are Used," available from your AEA.



If you take a trip across Iowa, you will find cattle, hogs, sheep, poultry, corn, soybean and hay production in almost every county. In each area of the state, you will find that certain types of production are more common. This is due to the soil, land features, temperature, rainfall and available markets.

This map of Iowa shows what each area is especially well known for.



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BEST COPY AVAILABLE

IOWA AGRICULTURE IOWA AGRICULTURE IOWA

IOWA AGRICULTURE IOWA AGRICULTURE IOWA AGRICULTURE IOW

IOWA CONTAINS 25% OF THE RICHEST AGRICULTURAL LAND IN THE WORLD.

IOWA LEADS THE NATION IN THE PRODUCTION OF CORN FOR GRAIN, AND TOTAL ACRES OF PRINCIPAL CROPS HARVESTED

IN 1978, IOWA RANKED SECOND IN TOTAL FARM EXPORTS WITH 27 BILLION DOLLARS EXPORTED.

IOWA RANKS NUMBER ONE IN HOG PRODUCTION PRODUCING ONE OUT OF EVERY FOUR HOGS IN THE UNITED STATES.

IOWA PRODUCES ABOUT 150 MILLION DOZEN EGGS EACH YEAR, IOWA ALONE PRODUCES EIGHT EGGS FOR EACH PERSON IN THE UNITED STATES.

IN IOWA IN 1981, THERE WERE 118,000 FARMS WITH AN AVERAGE SIZE OF 286 ACRES.

AGRICULTURE IS THE BASIC INDUSTRY IN IOWA, 60% OF IOWA WORKERS DEPEND DIRECTLY OR INDIRECTLY UPON AGRICULTURE FOR THEIR JOBS.

IOWA RANKS SEVENTH IN THE NATION IN TURKEY PRODUCTION.

AN IOWA BEEF PRODUCER RAISES ENOUGH BEEF TO FEED 411 PEOPLE.

THREE OUT OF FOUR IOWA ACRES ARE CROPLAND.

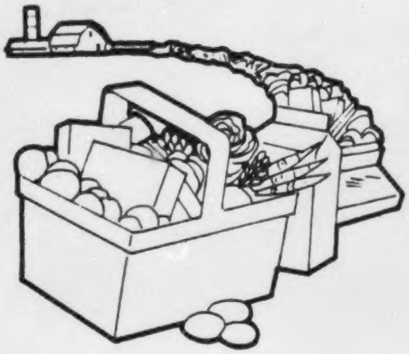
AN IOWA DAIRY FARMER ANNUALLY PRODUCES ENOUGH MILK FOR 136 PEOPLE.

AGRICULTURE IOWA AGRICULTURE IOWA AGRICULTURE IOWA IOW

AGRICULTURE IS ALWAYS NUMBER ONE IN IOWA

Unit 4
INFO-2

Visiting the Farm



Whose farm are you visiting?

How large is the farm?

How many city blocks would that be?

Livestock:

  What kind of animals are on the farm?

  How many are there?

  How are they fed?

  How much feed do they eat each day?

  What happens if they get sick?

  What do they weigh?

  What do they eat?

Crops:

  What kind of crops are grown on the farm?

  When are they planted and harvested?

  What needs to be done before planting?

  Why does the farmer grow these crops?

  How many days does it take to grow a crop?

  What is required by the plants to grow?

  Where does the farmer sell his crops?

Unit 4
ACT-1a

Visiting the Farm (con't)

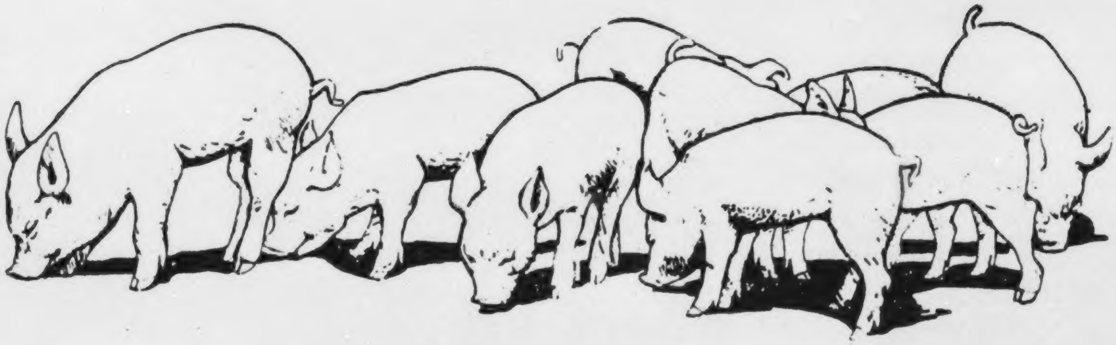
Make up three questions for the farmer.

1.

2.

3.

What is a farmer's day like?



A Quiz on IOWA Agriculture

1. Fill in the blank on how Iowa ranks in comparison with the rest of the United States.

__________Hog Production __________Corn Production

__________Cattle Production __________Soybean Production

2. What state has the largest number of sheep producers?

3. Iowa produces enough eggs to provide every person in the United States with ________ eggs per year.

4. Iowa's corn crop can circle the world __________ times if the bushel baskets were set side by side?

5. Iowa's dairy farmers produce __________ gallons of milk a year.

6. Iowa produces __________ of all the pork produced in the United States.

7. What played a large factor in the development of Iowa soils?

8. What three things enable Iowa to be a large producer of crops & livestock?

9. Name three kinds of livestock and three types of crops that are raised in Iowa?

10. Why are different types of crops and livestock raised in different parts of the world?

Unit 6

EATING FOR A HAPPY, HEALTHY BODY

Foods are divided into four groups according to their major nutritional contributions to the diet. Eating for good nutrition is much like putting together a jugsaw puzzle. Each basic food has different things you need. You have to put many different pieces together to get the whole nutrition picture. As a team, they include all the nutrients needed from a wide variety of foods. Each food supplies at least one essential nutrient, but no one food provides all the nutrients in the amounts needed.

Many superstar athletes believe that certain foods at certain times will help them win. For example,

--Muhammad Ali used to eat a thick steak six hours before every fight.
--Joe Namath and O.J. Simpson didn't eat anything on the day of a big game.
--Mary Decker, a world-class half-mile runner by the age of 14, ate a huge plate of spaghetti three hours before a race.

Nutrition experts agree that athletes don't need to eat anything special. Like everyone else, they just need a good balanced diet and the right number of calories.

Good nutrition and a balanced diet mean eating:

- Grains, especially whole grain foods.
- An assortment of fruits and vegetables.
- Milk or other dairy foods.
- Lean meats, poultry, and fish.
- Not too many fats or fatty foods, sugar or heavily sweetened foods or salted foods.

The Four Basic Food Groups Include:

1. Meat Group
   - Recommended servings - two daily.
   - Important for protein, niacin, iron and thiamin (B1).
   - Includes beef, pork, lamb, veal, poultry, eggs, fish, cheese and milk.
   - Dry beans and peas, soy extenders, and nuts combined with animal protein (meat, fish, poultry, eggs, milk, cheese) or grain protein can be substituted for a serving of meat.

2. Milk-Cheese Group
   * Recommended servings are determined by age and sex.

     Number of servings
     Children - 3 servings
     Teens - 4 servings
     Adults - 2 servings
     Pregnant women - 4 servings
   * Important for calcium, riboflavin, and protein.
   * Includes milk in any form: whole, skim, lowfat, evaporated, buttermilk, nonfat dry milk, yogurt, cheese, cottage cheese, ice cream, and ice milk.

3. Vegetable-Fruit Group
   * Recommended servings - four daily.
   * Important for vitamins A and C, and for fiber.
   * Dark green, leafy, or orange vegetables and fruit are recommended three to four times weekly for vitamin A.
   * Citrus fruit is recommended daily for vitamin C.

4. Bread-Cereal Group
   * Recommended servings - four daily
   * Important for thiamin (B1), iron, niacin, and carbohydrates.
   * Select only whole grain and enriched or fortified products. Includes all products made with whole grains or enriched flour or meal; breads, muffins, biscuits, pancakes, waffles, cooked or ready-to-eat cereals, cornmeal, grits, flour, spaghetti, macaroni, noodles, rice, barley, and rolled oats.

Fats and sweets should be eaten in moderation. They provide few or no nutrients, only calories. Fats and sweets include margarine, mayonnaise, salad dressings, fats, candy, sugar, jams, syrups, soft drinks, and other sweets. Also, included in this group are refined but unenriched breads, pastries, and flour products. Nutritionists believe you will get enough fats and sugars if you eat a balanced diet from the other food groups.

SUGGESTED ACTIVITIES

1. Using background information provided, discuss the four basic food groups. What foods are included under each of these groups?

2. Discuss the importance of reading labels. How can reading labels help prepare more nutritious, tasty, economical meals?

3. Ask students to bring in labels from prepared foods such as frozen dinners. What information must appear on the label? (All labels include the product name, net weight and ingredients listed in order by weight from largest to smallest. All fortified foods, and all foods for which a nutritional claim is made, must also include nutrition information on the labels.)
4. Invite a home economics extension agent to talk to your class about eating a balanced meal.
5. If possible, visit a home economics classroom at a local high school or extension service.
6. Make a collage from magazine pictures to represent the basic food groups. Sponsor a contest with a reward for the best collage display in the classroom.
7. Divide classroom into small groups and ask students to plan meals, using the basic food groups for one week.

THE SECRET SOMETHING IN MEAT

Put a check next to the meats you have eaten. Use the blank space to write the name of a meat you have eaten that is not on the list.

_____ pork chops

_____ steak

_____ spare ribs

_____ bacon

_____ hamburger

_____ pickled pigs feet

_____ roast beef

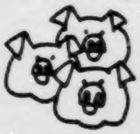
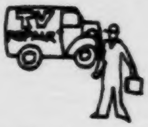
_____ sausage

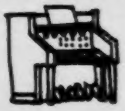
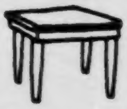
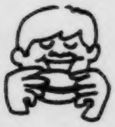
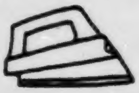
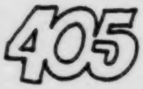
_____ liver

____

My favorite meat is ______________________

Most of us like to eat meat. But meat is also important because it gives us a "secret something" that our bodies need. To find out what the "secret something" is, fill in the blanks below. Then put the first letter of each word in the blank spaces at the bottom of the page.

Cattle and  (1)__________ do something very important for our bodies. If a television is broken, we can call the 

(2)____________________. If a muscle needs to be repaired, eating meat will help. Meat helps to keep our kidneys and other body  (3)______________s in good repair. One way to be taller is to stand on a  (4)__________. Another is to grow. The secret something that is found in meat also helps us to grow. All of us should  (5)__________ meat (or a member of the meat family) at least twice a day. Meat also gives us other important things, like  (6)______________, which is needed by the blood. It is easy to see that there are a 

(7)________________ of reasons that we should eat meat.

The "secret something" is:

1_______ 2_______ 3_______ 4_______ 5_______ 6_______ 7_______

ACT 106

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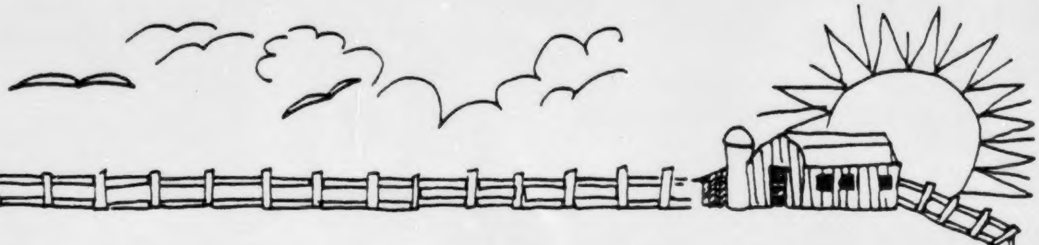


Unit 7
Chapter 1

YOUR FUTURE IN AGRICULTURE

Choosing a career can be the most important decision that can be made during a lifetime. That choice will determine employment, friends, associates, working conditions, residence, leisure time, standard of living, retirement security, and happiness. Choice of a career is a keystone to the rest of your life.

Each year thousands of young people quit school and go to work. Many feel that by dropping out of school and going to work that all their problems will be solved. Unfortunately, those who drop out of school are the same people who are unemployed or find the least opportunity for advancement. They have difficulty finding employment or advancing in a job because they failed to complete their education.

In your grandfather's generation, education was not as important as it is today. In his generation, the labor market required more "strength" than "brain." Young people entering the labor force today are required to have skills unheard of several decades ago. There is little room in the labor market for the uneducated and the unskilled. Agriculture is advancing in technology so rapidly that it requires persons with the most up-to-date general education as well as those with technical education.

The agricultural industry is a dynamic industry offering a great variety of employment opportunities to the American people. Approximately four million persons are actively engaged in producing food and fiber on the farms of America and another 20 to 26 million are engaged in processing, transporting, storing and selling agricultural products and/or providing services and supplies to farmers.

Iowa has many opportunities for students entering the agricultural profession. Agriculture is the basic industry in Iowa. Four out of ten Iowa workers depend directly on agriculture for their jobs and about six out of ten Iowa workers depend, directly, or indirectly, upon agriculture for their jobs.

Agricultural occupations in Iowa can be categorized into eight occupational families. These are:

1. Agricultural Production
2. Agricultural Supplies and Services
3. Agricultural Products
4. Agricultural Mechanics
5. Horticulture
6. Agricultural Resources and Forestry
7. Other Agricultural Occupations

An agricultural occupation may require education in one or more of the seven instructional areas.

1. Agricultural Production

This area involves a study of the economic use of agriculture labor, land, capital and management, efficient and safe operation of farm equipment, and the harvesting and handling of agricultural products. It also includes a study of field crops, livestock, vegetables and fruits, fiber and other crops on commercial and part-time farms.

Iowa is well known for producing high quality crops and livestock. The foundation of the states economy depends on production agriculture. Some farms grow only crops while other farms produce only animals or poultry. Many Iowa farms combine both by growing crops that are fed to animals that are produced on the farm. Listed below are some separate distinct occupations. However, the work of most Iowa farmers include a combination of several production agriculture occupations.

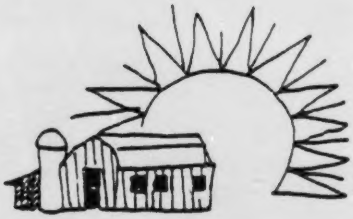
Some examples of agricultural production occupations:

Cattle Ranch Foreman
Veterinary Assistant
Cattle Buyer
Feed Truck Driver
Feed Lot Laborer
Dairy Farm Manager
Horse Production Employee
Broiler Grower
Poultry-Egg Producer
Turkey Producer
Sheep Rancher
Small Animal Supplier

Swine Producer
Corn Producer
Forage Producer
Apiculturist (Beekeeper)
Small Fruit Grower
Small Grain Grower
Soybean Producer
Chicken Hatchery Manager
Tree Fruit Grower
Vegetable Grower
Florist

2. Agricultural Supplies and Services

This area includes activities in the processing and selling of agricultural supplies such as livestock feeds, agricultural chemicals, seed, fertilizer, and other supplies including small equipment and the servicing of agricultural equipment.



Thousands of persons in Iowa are engaged in agricultural supplies and services occupations which are very essential to Iowa agriculture. New jobs are increasing in this area as agriculture continues to change. Some examples of agricultural supplies and services occupations:

Chemical Applicator
Service Mechanic
Warehouse Person
Sales Clerk
Farrier
Sales & Service Representative
Bookkeeper
Truck Driver
Seed Dealer
Dairy, Egg, Poultry Inspector
Milk Tester
Laboratory Animal Assistant
Pet Shop Worker
Animal Groomer
Soil Technician
Sheep Shearer
Well Driller
Veterinarian
Land Appraisal
Pharmaceutical Sales
Livestock Judge
Stable Person
Animal Trainer
Crop Duster
Painter
Welder
Farm Equipment Mechanic
Livestock Buyer
Garden Center Employee
Feed Dealer
Fertilizer Salesperson
Seed Cleaning Person
Insurance Salesperson

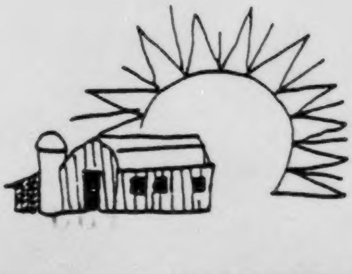
3. Agricultural Products

This area includes activities involved in the preparation of agricultural products for sale such as meats, poultry, eggs, dairy products, fruits, vegetables, cereal grains and nonfood products such as wool. Each agricultural product must be either assembled, sorted, tested, graded, processed, stored or marketed.

Many of Iowa's agricultural products need to be processed before they are sold to the consumer. There are many large processing companies in Iowa. For soybean processing alone, there are over 20 processors in Iowa.

Some examples of occupations in agricultural products processing and marketing include:

Milk Processor
Cheese Maker
Retail Meat Cutter
Meat Inspector
Egg Processor
Wool Grader
Egg Candler
Seed Analyst
Dairy Processor
Processed Meats Worker
Slaughter House Worker
Poultry Processor
Wool Buyer
Packager
Poultry Grader
Grain Elevator Operator



4. Agricultural Mechanics

This area is concerned with sales and service of agricultural machinery and related equipment. Activities include assembly, adjustment, maintenance and repair of machinery or agricultural buildings.

Agriculture in Iowa is heavily mechanized. Farmers rely on people in agricultural mechanics to keep their equipment in top-notch condition. Some examples of occupations in agricultural mechanics include:

Production Agriculture Mechanic
Tractor Mechanic
Parts Person
Small Engine Mechanic
Farm Tractor & Equipment Operator
Farm Equipment Salesperson
Service Department Manager
Set-Up Person
Electrician
Agricultural Engineer
Machinery Manager
Machine Production Worker

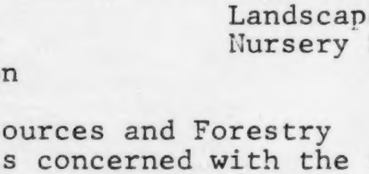
5. Horticulture

This area deals with people who work in occupations that specialize in planting, caring for, and marketing trees, shrubs, plants, flowers, and turf areas. Horticulture also includes sales and services in greenhouses, garden centers and nurseries. Some examples of occupations in horticulture include:

Tree Manager
Floral Delivery Person
Floral Shop Manager
Landscape Planter
Grounds Worker
Nursery Worker
Nursery Salesman
Parks & Recreation Foreman
Tree Pruner
Tree Surgeon
Floral Sales Person
Floral Designer
Greenhouse Foreman
Retail Landscape & Garden Store Salesperson
Plant Propagator
Golf Course Maintenance Worker
Pest Control Specialist
Landscape Architect
Nursery Shipping Clerk

6. Agricultural Resources and Forestry

This area is concerned with the improvement and conservation of resources such as fish and wildlife, soil, water and air, forested and other national areas. It also includes the management of trees and includes the protection of forests, recreation, wood utilization and special products.



Iowa has over 60 state parks and numerous county parks and recreation centers. Iowa is a popular place for hunting and fishing. The conservation of Iowa's topsoil is very important to the Iowa farmer. Some examples of occupations in agricultural resources and forestry include:

- Air Pollution Control Inspector
- Zoning Compliance Officer
- Hunting & Fishing Guide
- Park Warden
- Forest Fire Ranger
- Wood Producer
- Soil Scientist
- Lodging Facilities Manager
- Fish Hatchery Worker
- Land Use Planning Technician
- Campground Manager
- Park Aide
- Soil Conservation Technician
- Wildlife Conservation Officer
- Christmas Tree Farmer
- Sawmill Worker
- Trapper
- Gamekeeper

7. Other Agriculture

This area includes government services, education, inspection, regulation and specialized business services not included in the first six categories.

Iowa has a wide variety of jobs available in agriculture. Many jobs in agriculture offer support services for the other phases of agriculture. Some examples of other agricultural occupations include:

- Farm Appraiser
- County Extension Service
- Chemical Inspector
- Loan Officer
- Market Analyst
- Field Reporter
- Market Reporter
- Agricultural Statistician
- Agricultural Editor
- Farm Media Broadcaster
- Agricultural Consulting
- Commodity Association Representative
- Agricultural Professor
- Farm Placement Officer
- Agricultural Journalist
- Food and Drug Inspector
- Vocational Agriculture Instructor
- Agricultural Advertising Specialist
- Photographer
- Agricultural Reporter
- Public Utilities
- Agricultural Foreign Service Representative

SUGGESTED ACTIVITIES

1. List the eight agricultural occupation areas on the blackboard. Ask students to select one area they might be interested in working in or learning more about. Try to divide groups equally, if possible.

2. Using a classroom bulletin board, divide the space into eight separate sections with border strips. Let each section represent one occupational area within agriculture. Conduct a contest for best display.

3. Using magazines, publications, brochures, or other informational sources, let students prepare collages, draw pictures, etc. to represent their particular area. Represent both products and occupations within that area. Upon completion, invite your principal to be the judge based on originality and select a first and second place winning group.

4. Then ask each student within a group to prepare an individual report on a particular occupation within that area. Ask students to report on duties, qualification, training, etc.

5. If possible, invite resource persons representing a particular occupation, to speak to your class or visit them at their place of business to give students first hand knowledge of their duties.

6. Collect "Help Wanted" advertisements and classify available positions by agricultural area. Post on a bulletin board.

7. To show the importance of agriculture in Iowa, have ten students stand up in front of the class. These ten students will represent all Iowa workers. Have three students stand in a group to represent all Iowa workers that depend directly on agriculture for their job and then have another three students join them to represent all Iowa workers that depend directly or indirectly on agriculture for a living.

13. Cloning will be common. One animal could produce thousands of offspring.

14. Farmers will produce products that are easily marketable. Square tomatoes may be grown to facilitate easier packaging.

15. Better markets and transportation systems will keep the prices from fluctuating and move the food and products to where it is needed the most.

These are just ideas of things that might happen in the future. No one can predict the future so let your imagination be your guide!

SUGGESTED ACTIVITIES

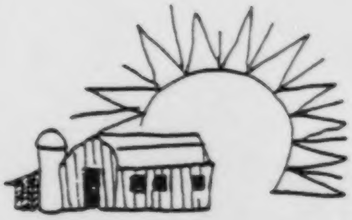
1. Have students identify problems of today's farmers. On the blackboard, list the problems, i.e.:
    - changing weather
    - disease
    - insects, weeds
    - fluctuating prices
    - high costs
    - transportation to consumer
    - marketing
    - low yields
    - worldwide hunger
    - over production

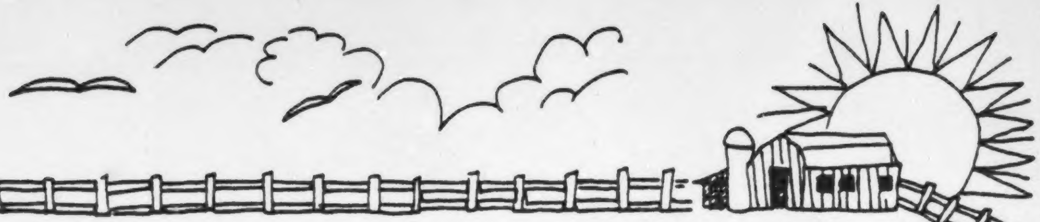
    Divide the class into small groups and have each group take a problem and try and solve it. Some ideas for solutions can be found in the teacher information section. Have the students discuss possible solutions with the class.

2. Have students draw pictures of how plants, animals, and machines may change in the future. An example would be a corn plant with many ears of corn or a sow with a large number of offspring.

3. Have students pose questions for the future. Some examples:
    - -Will cows give chocolate milk?
    - -Will tomatoes and eggs be square?
    - -Will one plant grow both lettuce and carrots?

4. Discuss with students how agricultural occupations may change in the future.





Unit 7
Chapter 2

THE FUTURE OF AGRICULTURE

What will agriculture be like in the year 2050? Technological advances change agriculture on a daily basis. As technology increases, the risks farmers take are decreased. Increased technology also means the farmer of the future needs more specialized education. Below are some ideas on how farming might be changed in the future.

1. Crops will be grown in large environment-controlled fields. These would resemble huge greenhouses where everything could be controlled including the weather.
2. Computers will play a larger part in agriculture. A computer will control everything from planting to harvesting.
3. Airfoils or tractors that ride on a bed of air will be used instead of the present day tractors to prevent compaction of the soil.
4. Machines will do many functions at one time - from harvesting a crop to planting the next crop.
5. Crops will have higher yields due to genetic improvement. One cornstalk will produce many ears of corn.
6. Chemicals will be used less due to environment controlled buildings.
7. Solar power will be the energy source of the future.
8. Machines will be used that harvest and process the crop in one step.
9. Crops will be grown in water instead of soil.
10. Less diversity of plants will be grown but more products will be made from these plants.
11. Farms will be larger and more specialized.
12. Animals will not graze on pastures but will be fed computerized rations.

GLOSSARY

Acre - Land measure containing 43,560 feet; about the size of a football field.

Agricultural Revolution - A major change in how farmers raise crops and livestock.

Agriculture - The science or art of cultivating soil, producing crops, raising livestock.

Barrow - A casturated male pig.

Branded - A system of identifying livestock.

Bull - Male cattle over one year old.

Bushel - A unit of dry measure containing 32 quarts.

Castration - The removal of the male sex glands to increase the rate of growth.

Chick - A chicken from hatching to eight weeks of age.

Cock - A male chicken over 18 months old.

Combine - A harvesting machine which cuts and threshes grain while traveling across the field.

Controlled Breeding - Selection of both male and female desirable traits to produce superior offspring.

Corn, Dent - Field corn; the corn kernal has a small dent on the bottom.

Corn, Field - Corn used primarily for animal feed - usually dent corn.

Corn, Seed - Corn developed for use as seed.

Corn, Sweet - Corn used primarily for human consumption.

Cow - Female cattle after calving.

Crop Rotation - Planting a crop in a different field each year.

Cultivator - An implement used for the purpose of loosening the earth about the roots of a plant to kill weeds.

Ewe - An adult female sheep.

Farrowing - The act of giving birth to baby pigs.

Fertilizer - A substance that supplies nutrients to the plant.

Foreclosure - The banks (or mortgagee) makes the farmer (mortgager) pay the money due on the mortgage or give up the property.

Gilt - A young female pig.

Gizzard - The stomach of birds in which food is crushed by means of swallowed pebbles.

Heifer - Female cattle over one year old - has not yet produced calves.

Hen - A chicken over 18 months old.

Herbicide - Chemical used to kill weeds.

Horticulture - The art or science of growing flowers, fruit, vegetables, garden or orchard.

Insecticide - Chemical used to kill insects.

Lamb - A young sheep under six months.

Lambing - The act of giving birth to baby sheep.

Layer - Female chicken raised specifically to produce eggs.

Piglet - A young pig under eight weeks old.

Plow - An implement used for breaking and turning the soil.

Plowshare - The part of the plow that cuts and turns the soil.

Ram - An adult male sheep.

Revolution - A major change in any situation.

Scythe - An instrument used in mowing or reaping, consisting of a long curving blad fixed to a handle.

Silage - Cornstalks that have been chopped - use as animal feed.

Sow - An adult female pig that has had a litter of pigs.

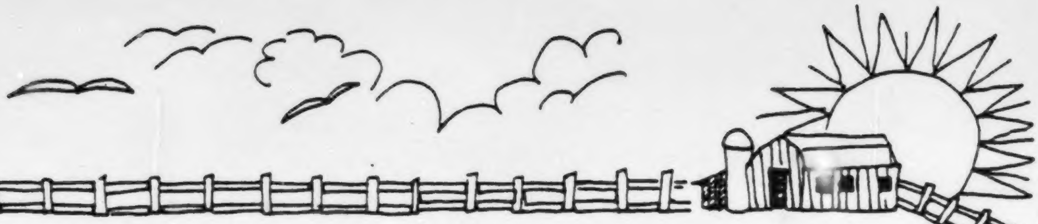
Steer - Castrated male cattle over one old.

Threshing - Separating the seed (grain) from plant.

Turkey Hen - An adult female turkey over 26 weeks old.

Veal - Meat from young cattle.

Weaning - The removal of young from the mother when they become old enough to feed themselves.



Field Trips Sites

Iowa Conservation Education Center
R. R. 1, Box 53
Guthrie Center, Iowa 50115
515-747-8383
Open 8:00 a.m. to 4:30 p.m. Monday through Friday,
Year-Round

The Education Center serves to provide the educational background and experience needed to give citizens of all ages the chance to increase understanding and appreciation of the natural world.

Living History Farms
Rural Route 1
Des Moines, Iowa 50322
(515) 278/5286

Living History Farms is an open air museum. Interpreters will help you and your class experience the rural life of Iowa's past through a pioneer farm of the late 1840's, a 1900 farm and the developing community of Walnut Hill.

Educational programs including community living, food production, and school in a one-room school house are offered Monday through Thursday mornings with general tours weekday afternoons and all day Friday, Saturday, and Sunday. Please schedule as far in advance as possible. A teacher's guide will be sent once the tour is scheduled to help prepare the students for the field trip.

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